ZyXEL

The Next Key to Broadband Success

FTTx
Product Guide

- MSAN/DSLAM Solution
- Fiber Access Solution
- DSL CPE Solution

Success formula of broadband services

The success of triple-play and rich media services relies on the operators' ability to provide a dramatically enhanced experience through user-centric broadband services balanced with the best performance and cost effectiveness. The demand for service flexibility and economy requires operators to offer many access types and technologies to reach all subscribers effectively through both fixed and mobile broadband connectivity.

ZyXEL's versatile technology platform

ZyXEL's Solutions for Service Providers are the best choice for telco operators to establish the next-generation broadband access networks. It provides not only diversified access technologies (POTS, xDSL, Fiber, E1 and 10G Uplinks) to minimize operators' investment on access networks, but also a robust and scalable platform for businesses to grow upon. Moreover, it is a medium capable of supporting existing services like legacy telephone and DSL broadband services widely deployed along with emerging services like VoIP, FTTx and even bandwidth-driven IP TV.

Flexibility and performance for more profit

Designed to minimize impacts on the adopting enterprises, these technologies are capable of maintaining a unified pattern of operations across all access networks. The infrastructure provides operators with the flexibility and headroom to introduce new services and scale existing ones without compromising on cost or performance, so operators can concentrate on attracting and retaining customers through their innovative service offerings, as well as leveraging the brand equity generated by their ability to deliver services flawlessly.

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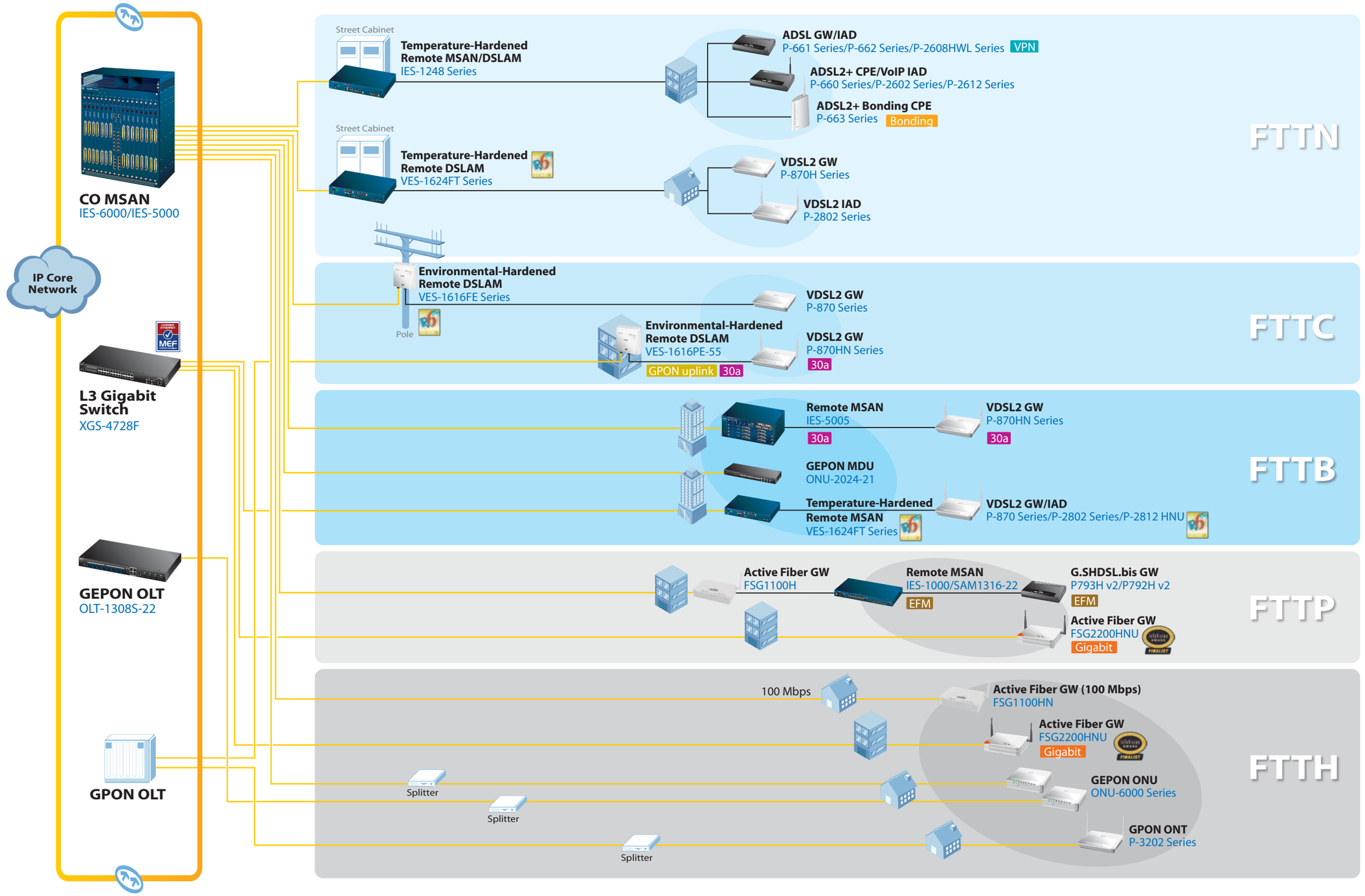
Blazing-fast Services for an Edge

FTTx solution is a most popular next-generation broadband access solution adopted by worldwide leading service providers. It is not only offering symmetric 100 Mbps or 1000 Mbps bandwidth to homes, but also high-definition IPTV, video on demand, music on demand, home monitoring and control, high-resolution 3D format video and more premium triple-play services. Service providers can choose the best FTTx solution to retain existing subscribers or win more new ones under future extension, market competition and economic considerations.

Leading FTTx Solutions from ZyXEL

ZyXEL offers a complete and the best price/performance FTTx solution, including FTTN, FTTC, FTTB, FTTP and FTTH solutions. ZyXEL is the largest VDSL CPE vendor by unit shipment in 2009, the fourth leading DSL CPE vendor by unit shipment in 2009 and the sixth leading IPDSLAM vendor by unit shipment in 2009 worldwide. ZyXEL has a full commitment on developing FTTx technologies to offer competitive and innovative FTTx services with high-level reliability, quality and long-term partnership support.

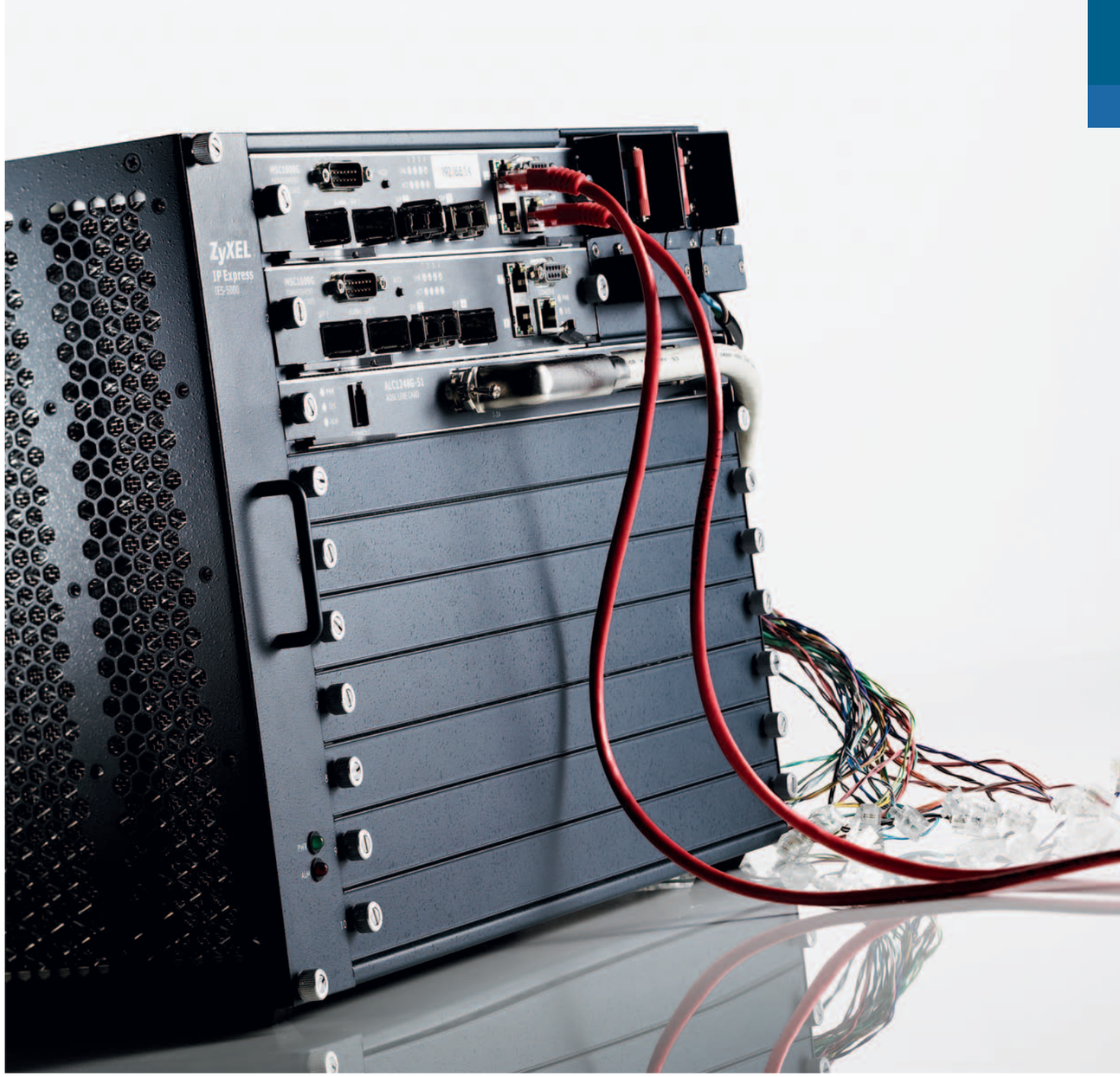


FTTx Product Lines
Solution Scenario

FTTx Product Lines
Comparision

The following table shows the alternatives for service operators to choose from:

Competitors' Solution	To Use ZyXEL Solution	Benefits
MSOs offer DOCSIS 3.0 with downstream 160 Mbps and shared upstream 120 Mbps bandwidth	To offer symmetric 200 Mbps or 300 Mbps bandwidth by using ZyXEL end-to-end Gigabit Active Fiber solution.	To win the leading market position quickly by cooperating fiber infrastructure owner. Offer RFoG TV service.
DSL service providers offer VDSL2 downstream 100 Mbps and upstream 50 Mbps bandwidth	To offer symmetric 100 Mbps bandwidth by using ZyXEL end-to-end VDSL2 30a solution.	Can offer multi-HD IPTV or 3D TV in a single home. FTTC/VDSL2 deployment cost is 1/8 of GPON and P2P/AE.
	To offer downstream 100 Mbps and upstream 50 Mbps bandwidth by using ZyXEL end-to-end VDSL2 17a solution.	The best end-to-end approach to reduce CAPEX and OPEX.
	To offer symmetric 100 Mbps bandwidth by using ZyXEL end-to-end 100 Mbps Active Fiber solution.	The best end-to-end approach to reduce CAPEX and OPEX. Offer RFoG TV service.
	To offer symmetric 125 Mbps bandwidth by using ZyXEL end-to-end GEPON solution (w/ 10 shared clients)	The best end-to-end approach to reduce CAPEX and OPEX. Offer RFoG TV service.
	To offer downstream 156 Mbps and upstream 78 Mbps bandwidth by using Tier-1 GPON OLT and ZyXEL GPON ONT solution (w/ 16 shared clients)	Leading all-in-one IAD and support IPTV fast channel and RFoG TV service.
DSL service providers offer ADSL2+ downstream 24 Mbps and upstream 1 Mbps bandwidth	To offer downstream 48 Mbps and upstream 2 Mbps bandwidth by using ZyXEL end-to-end ADSL2+ bonding solution.	Quick to offer premiums triple-play services based on existing ADSL2+ infrastructure.



MSAN/DSLAM

Central MSAN ... 08
Remote MSAN/DSLAM ... 10
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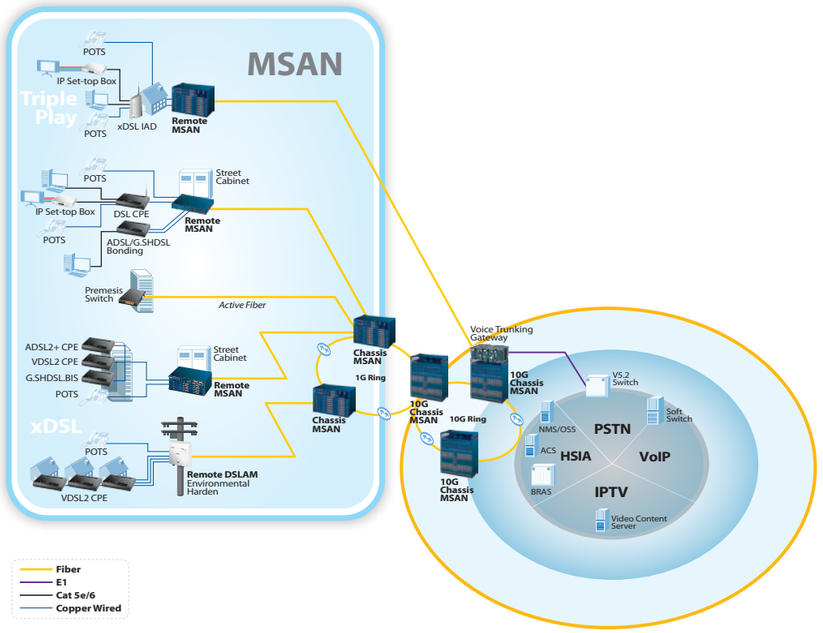
IES MSAN

Modular Chassis MSAN

Application diagram



Advantages

Your requirements

The IES-6000 and the IES-5000 series are ideal for networks in larger 2-wire environments like hotels, hospitals, students' halls of residence, industrial plants, or blocks of flats.

The modular chassis MSAN can accommodate up to 16 line cards and 2 management cards. Along with a maximum of 1152 ADSL2+ connections other variations like SHDSL, VDSL2 or VoIP can be applied. Additional splitter chassises and splitter cards enable the parallel operation of voice and data over a 2-wire line. Management cards and power supplies, which can be configured as redundant components, offer an additional level of network security.

High-end xDSL Networks with Up to 1152 Ports for Service Providers, Enterprises and Large Building Complexes

- Up to 1152 ADSL2+ ports
- Multi-service interfaces including ADSL2/2+, G.SHDSL.bis, VDSL 2 and, VoIP, E1 IMA and Fast Ethernet
- Parallel operation of voice and data via one 2-wire line
- Extensive QoS features to improve Triple Play functionality
- Flexible ACL, VLAN-related DHCP and anti-IP/MAC address spoofing to protect malicious attacks
- Integrated DHCP Option82 relay and ARP proxy to increase network stability
- PPPoAoE, TACACS+ support for remote registry of legacy routers

IES-6000M
Main chassis, 16 line card slots

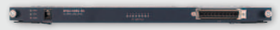
IES-5000M
Main chassis, 8 line card slots

IES-5005M
Main chassis, 4 line card slots

MSC1224G
Management card for IES-6000, 2 x 10 Gbit XFP, 2 x Gbit SFP slots, 2 x Gbit Base-T, 2 x Gbit Base-T/SFP dual personality

ELC1220G-55
Ethernet line card with 20 ports Ethernet SFP (100Base-FX/BX/LX)

MSC1024G
Management card for IES-6000, 2 x Gbit Base-T, 4 x Gbit SFP slots, 2 x Gbit Base-T/SFP dual personality



IMA1408G-81
E1 IMA line card with 8 ports

SLC1248G-22/SLC1348G-22
G.SHDSL/G.SHDSL.bis line card with 48 ports, for data transfer of up to 5.69 Mbps (2-wire), 22.76 Mbps (4-wire) and 45.52 Mbps (8-wire), ATM/EFM Mode

MSC1000G
Management card for IES-5000 and IES-5005, 2 x Gbit SFP slots, 2 x Gbit Base-T/SFP dual personality

VLC1324G-51/VLC1324G-53/ VLC1424G-56/VLC1348G-51
VDSL2 line card with 24/48 ports with support for ADSL2+ and up to 100/100 Mbps data transfer (profile 30a)

ALC1248G-51/53, ALC1272G-51
ADSL2/2+ line card with 48/72 ports, Annex A (-51) or Annex B (-53), for data transfer of up to 25/2.4 Mbps (ADSL2+)

VOP1248G-61
VoIP line card with 48 ports for SIP or H.248

Specifications

Extension slots	15/16 x line cards, 2/1 x management cards (IES-6000) 8 x line cards, 2 x management cards (IES-5000) 4 x line cards, 1 x management cards (IES-5005M)
Performance	8 queues with packet priority scheduling (SPQ/WRR), supports 512 IGMP multicast groups, highest duration of channel zapping 250 ms, DSCP to 802.1p priority mapping
Security	Isolation per port and VLAN, IEEE 802.1x authentication, rule-based packet filtering (L2 ~ L4 ACL), MAC count limiting, ARP broadcast filtering, DHCP broadcast filtering, VLAN based DHCP snooping, NetBIOS filtering, IGMP filtering, anti-IP/MAC address spoofing, supports TACACs+
VLAN	4096 IEEE 802.1Q compatible VLAN tagging, VLAN stacking (Q-in-Q), VLAN bridge function (multiple PVCs to VLAN)(N:1), PVC to VLAN 1:1 mapping, VLAN trunking (one PVC to several VLANs)(1:N), supports GVRP
Management	SNMP v1/v2/v3, CLI, web management, EMS (NetAtlas Access)
Special features:	All front access; temperature harden (-40°C to +65°C) IES-5000 & IES-5005 only; NEBS certified (IES-5000)
Mounting	19" rackmount, 12.5/6.5/3.5U (IES-6000/5000/5005M)
Power supply	-36 ~ -72 V DC

IES-1248 Series

Temperature-Hardened Remote MSAN

Feature-rich MSAN/DSLAM for Asymmetrical Services with High Bandwidth for Data, Voice and Several Video Channels

- Remote MSAN/DSLAM for DC or AC operation
- Extremely compact and weather-proof design
- Band internal administration and a mini-RJ11 port for the local console
- 48 port ADSL/ADSL2/ADSL2+ module with integrated splitter
- Hot swappable fan module for increased flexibility

IES-1248-51/53
48-port ADSL2+ Remote DSLAM, with splitter built-in, temperature-hardened, DC power (-40°C to +65°C)

IES-1248-51V
48-port ADSL2+ with/or VoIP Remote MSAN, temperature-hardened, DC power (-40°C to +65°C)

IES-1248-51A
48-port ADSL2+ Remote DSLAM, with splitter built-in, AC power (0°C to +50°C)

Advantages

The IES-1248 is especially suitable for ADSL installations in buildings or for service providers.

Equipped with 48 ports and extensive QoS, the ADSL2+ remote DSLAM is extremely powerful and versatile and can be applied in a wide variety of applications. Three application scenarios (or mixed forms of these) are especially typical for the IES-1248: Internet or video connection in hotels, network connections of different companies in one office building, Internet access over the public telephone network. The IES-1248 has an operating temperature range of -40°C to 65°C making it suitable for operation in a street cabinet.

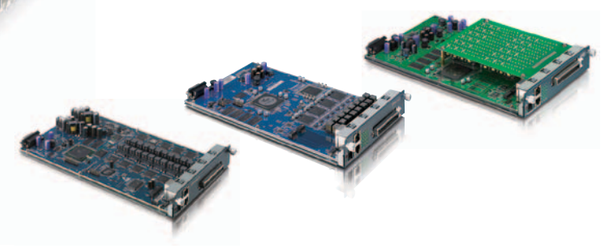
Specifications

Network interfaces	4 x Telco-50 for up to 48 x ADSL2+ ports, 2 x 1 Gbit dual personality Base-T/SFP slots
ADSL2+ data throughput	Up to 2.4/25 Mbps up and download
Data transfer and prioritization	802.1p (4 priority queues per port), 802.1q VLAN, multicast VLAN, SPQ, GVRP, ATM QoS to 802.1p mapping, ATM PVC to 802.1p mapping, IGMP, GVRP
Security	Multiple PVC (8 per port), MAC filtering, MAC number limiting, IGMP filtering, DHCP snooping/ filtering, packet filtering, 802.1x authentication
Redundancy	802.1w RSTP
VoIP	SIP/H.248, G.711a/u, G.723, G.726, G.729ab, MLT, DTMF, T.38
Management	Web GUI, CLI, SNMP, EMS support, RJ-11 local management port
Special features	ISDN/POTS splitter built-in, hot swappable fan module
Mounting	19" rackmount, 1.5 U
Power supply	-48 V DC (-36 ~ 72 V DC), 100 ~ 240 V AC, 50/60 Hz
Dimensions	440 x 250 x 66 mm (WxDxH)

IES-1000

Remote MSAN

The Ideal xDSL Solution for Mixed Environments



- Two slots for different DSL modules
- 12 port ADSL/ADSL2/ADSL2+ module with integrated splitter
- 16 port EFM/ATM SHDSL/G.SHDSL.bis module for wide coverage
- 24 port VoIP module for voice service
- Two Fast Ethernet interfaces for uplink
- Supports 802.1p QoS, priority queuing, 802.1q VLAN tag and multicast

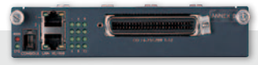
IES-1000
Remote MSAN with 2 x ADSL/G.SHDSL/VoIP extension modules

Advantages

The IES-1000 is a G.SHDSL- and/or an ADSL remote MSAN. It can be employed as a DSLAM or MSAN for service providers or for broadband solutions in large building complexes. ZyXEL's product range also includes the corresponding end devices P-791R and P-793H (both G.SHDSL) and P-66x (ADSL, ADSL2+). The modules of both technologies can be used in the chassis in mixed mode or serve as remote MSAN to provide VoIP voice service by inserting VoIP module.

Specifications

Network interfaces	2 x extension slots
Extension slots	Support ADSL2+, G.SHDSL, G.SHDSL.bis, VoIP (SIP) extension cards
Data transfer and prioritization	802.1p (4 priority queues per port), 802.1q VLAN, multicast VLAN, SPQ, GVRP, ATM QoS to 802.1p mapping, ATM PVC to 802.1p mapping, IGMP, GVRP
Security	Multiple PVC (8 per port), MAC filtering, MAC number limiting, IGMP filtering, DHCP snooping/filtering, packet filtering, 802.1x authentication
Redundancy	802.1w RSTP
VoIP	SIP, G.711a/u, G.723, G.726, G.729ab, MLT, DTMF, T.38
Management	Web GUI, CLI, SNMP, EMS support
Special features	Hot swappable, temperature supervision/alarm
Mounting	19" rackmount, 1 U
Power supply	100 ~ 240 V AC, 50/60 Hz or -48 V DC (-36 ~ 72 V DC)
Dimensions	440 x 320 x 44 mm (WxDxH)



AAM1212-51/53
ADSL2+ extension module with bulit-in splitter

Network interfaces
1 x Telco-50 for up to 12 ADSL2+ ports,
2 x 10/100 Mbit Base-T

SAM1216-22/SAM1316-22
G.SHDSL.bis extension module

Network interfaces
1 x Telco-50 for up to 16 G.SHDSL.bis ports,
2 x 10/100 Mbit Base-T

VOP1224-61
VoIP extension module

Network interfaces
1 x Telco-50 for up to 24 VoIP ports,
2 x 10/100 Mbits Base-T

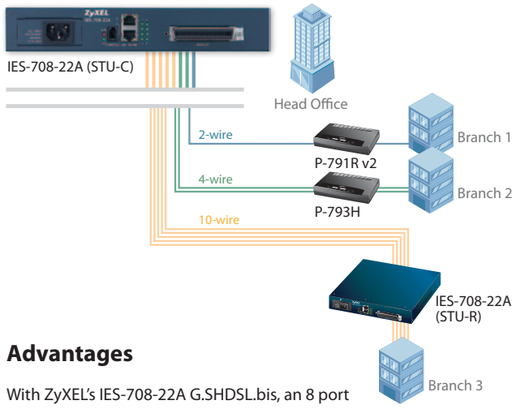
IES-708

G.SHDSL Compact DSLAM

For Symmetrical G.SHDSL and Point-to-point Connections of Up to 45.6 Mbps Bandwidth via Port Bonding

- Supports ATM-based multi-paired bonding (bundling of up to 8 ports with 45.6 Mbps)
- Extended ATM and Ethernet QoS, functions for Triple Play
- Simple realisation of point-to-point applications
- Management via web, Telnet and CLI
- Extended multicast functions for IPTV applications

Application diagram



Advantages

With ZyXEL's IES-708-22A G.SHDSL.bis, an 8 port DSLAM, by using port bonding it is possible to create symmetrical connections. Bundling up to eight pairs of copper wires makes point-to-point connections of up to 45.6 Mbps possible. By means of the multi-pair bonding function (ITU G.bond or ITU G.998.1) between two IES-708 if a link fails the data traffic is distributed to the remaining connections within the group. When the link becomes available again, it is automatically reintegrated into the group. Different or unsteady line quality within the group does not cause any interruptions. The ZyXEL IES-708-22A can – depending on the firmware which is loaded - be applied as either a STU-C (IP-DSLAM) or STU-R (end device).

IES-708-22A
8-port G.SHDSL Compact DSLAM, 19" rackmount

Specifications

Network interfaces	1 x Telco-50 for up to 8 x G.SHDSL ports, 2 x 10/100 Mbps Base-T
G.SHDSL data throughput	Port up to 5.69 Mbps, up to 45.6 Mbps during port bonding, G.SHDSL standards G.991.2, G-998.1
Security	IGMP snooping for multicast traffic, 802.1p QoS, DHCP relay, port isolation, 256 static VLANs, 4,000 MAC addresses
Multicast	IPv4 multicast forwarding, static multicast membership, IGMP v1/v2 snooping proxy mode, shared VLAN multicast, IGMP filtering/limiting, MVLAN, DSL port bandwidth control
Management	Web GUI, CLI, SNMP v1/v2, EMS support, RJ-11 local management port
Special features	ATM based multi paired bonding support
Mounting	19" rackmount, 1 U
Power supply	100 ~ 240 V AC
Dimensions	440 x 250 x 44 mm (WxDxH)

IES-612

ADSL2/2+ Compact DSLAM

Inexpensive Stand-alone DSLAM Solution with 12 ADSL2+ Ports for Smaller Installations

- 12 port ADSL2/2+ Annex A device with integrated splitter
- QoS functions for modern Triple Play applications
- ADSL standards: Annex A/L/M (G.992.1, G.992.3, G.992.5)
- Web management, Telnet configuration and supervision
- 802.1Q VLAN aware bridging
- 4 priority queues per PVC

IES-612-51/51A
12-port ADSL2+ Compact DSLAM, with splitter built-in, 19" rackmount

Advantages

The IES-612 Compact DSLAM is an ideal solution for smaller installations which only require a few 2-wire connections.

The built-in splitter enables parallel operationof voice and data services. All necessary function for application in convergent networks, like IPTV or Voice over IP areintegrated. The device has an exchangeable power supply and can be installed in a 19" rack.

Specifications

Network interfaces	1 x Telco-50 for up to 12 x ADSL2/2+ ports, 2 x 10/100 Mbps Base-T
ADSL2/2+ data throughput	Up to 2.4/25 Mbps up and download
ADSL standards	G.992.1, G.992.3, G.992.5
Security	IGMP snooping for multicast traffic, 802.1p QoS, DHCP relay, port isolation, 256 static VLANs, 4,000 MAC addresses
Multicast	IPv4 multicast forwarding, static multicast membership, IGMP v1/v2 snooping/proxy mode, shared VLAN multicast, IGMP filtering/limiting, MVLAN, DSL port bandwidth control
Management	Web GUI, CLI, SNMP v1/v2, EMS support, RJ-11 local management port
Special features	ATM based multi paired bonding support, POTS splitter built-in
Mounting	19" rackmount, 1 U
Power supply	100 ~ 240 V AC, 50/60 Hz or -48 V DC (-36 ~ 72 V DC)
Dimensions	270 x 350 x 44 mm (WxDxH)

VES1616FT-54
VES1624FT-54
VES-1624FT-55A

Temperature-Hardened
Remote VDSL2 DSLAM

High-speed Compact VDSL2 Technology

- VDSL2 with support for data transfer up to 100/50 Mbps with ADSL2+ fall back support (VES-1624FT-55A)
- 2 x 1 Gbps dual personality Base-T/SFP slots
- Complete Ethernet VLAN and multicast functions

VES1616FT-54
16-port VDSL2 DSLAM, with ANSI splitter built-in, temperature hardened, dual power (0°C to +65°C)

VES1624FT-54
24-port VDSL2 DSLAM, with ANSI splitter built-in, temperature hardened, dual power (0°C to +65°C)

VES-1624FT-55A
24-port VDSL2 DSLAM, with ETSI splitter built-in, temperature hardened, AC or DC power (AC: -10°C to +60°C; DC: -40°C to +65°C)

Specifications

Network interfaces	2 x Telco-50 for up to 16/24 VDSL2 ports 2 x 1 Gbps dual personality Base-T/SFP slots
VDSL data throughput	Up to 100/50 Mbps up and download (profile 17a)
VDSL functions	Long reach support, high INP support, trellis coding, user-defined PSDs and band plans, configurable RFI bands, VDSL2 framing
System functions	Bandplan support, DHCP server/relay, VLAN, VLAN stacking, MVR, port mirroring, static route, IGMP, 802.1x RADIUS
Redundancy	802.3ad link aggregation, 802.1w RSTP, 802.1d STP
Quality of Service	802.1p (8 priority queues per port), traffic shaping, rule-based bandwidth management, storm control, ACL, DSCP to 802.1p mapping, 802.3x flow control
Management	Web GUI, Telnet, FTP, CLI, SNMP, SSH, EMS support
Special features	POTS splitter built-in, Out-of-Band management port, ADSL2+ fall back (VES-1624FT-55A only)
Mounting	19" rack mount, 1.5U
Power supply	100 ~ 240 V AC, 50/60 Hz 48 V DC (-36 ~ 72 V DC)
Dimensions	440 x 250 x 66 mm (WxDxH)

VES-1608FE
VES-1616FE

Environmental-Hardened Remote VDSL2 DSLAM

Compact, Sealed and Full-featured OSP VDSL2 Technology

- VDSL2 with support for data transfer up to 100/50 Mbps with ADSL2+ fall back support
- Environmental hardened switch for Wall Mount
- Fan-less design for low maintenance
- 2 x 1 Gbps dual personality Base-T/SFP slots
- Complete Ethernet VLAN and multicast functions

VES-1608FE-53A
VES-1616FE-53A/55A
8/16-port VDSL2 DSLAM, with ETSI splitter built-in, environmental hardened (0°C to +60°C)

Specifications

Network interfaces	Quick connector for 8/16 VDSL2 ports 2 x 1 Gbps dual personality Base-T/SFP slots
VDSL data throughput	Up to 100/50 Mbps up and download (profile 17a)
VDSL functions	Long reach support, high INP support, trellis coding, user-defined PSDs and band plans, configurable RFI bands, VDSL2 framing
System functions	Bandplan support, DHCP server/relay, VLAN, VLAN stacking, MVR, port mirroring, static route, IGMP, 802.1x RADIUS
Redundancy	802.3ad link aggregation, 802.1w RSTP, 802.1d STP
Quality of Service	802.1p (8 priority queues per port), traffic shaping, rule-based bandwidth management, storm control, ACL, DSCP to 802.1p mapping, 802.3x flow control
Management	Web GUI, Telnet, FTP, CLI, SNMP, SSH, EMS support
Special features	POTS/ISDN splitter built-in, Fiber Tray and Out-of-Band management port, ADSL2 fall back
Mounting	Wall mounted unit with key lock
Power supply	100 ~ 240 V AC, 50/60 Hz
Dimensions	380 x 104 x 390 mm (WxDxH)

Product Family	Your Requirement	Typical Application
IES-6000 12.5U Central MSAN 17 slots	• 10G, central, high capacity • Chassis based & hot swappable • Ring or tree topology • DHCP/PPPoA/PPPoE • Mass flat layer-2 deployment • Redundant management card & power supply • 6 SFP + 4 100/1000Base-T/2 10G SPF + 6 100/1000Base-T • ADSL2+, VDSL2, G.SHDSL.bis, VoIP and fiber-based Ethernet line cards • Multicast/Unicast IPTV service • PSTN service replacement	Up to 1152 per node, xDSL service for mass residential and SMB services. 10G upgrade available to prevent limitation of future bandwidth requirement such as PON. Design for flat Layer-2 mass deployment with Layer-2+ deployment that overcome 16K MAC address limitation of networks as well as legacy authentication.
IES-5000 6.5U Central/Remote MSAN 8 slots	• Central/remote, temperature-hardened • Chassis based & hot swappable • Ring or tree topology • DHCP/PPPoE/PPPoA • Mass flat layer-2 deployment • Redundant management card & power supply • 4 SFP + 2 100/1000Base-T • ADSL2+, VDSL2, G.SHDSL.bis, VoIP and fiber-based Ethernet line cards • Multicast/Unicast IPTV service • PSTN service replacement	High density 576-port DSLAM that is well-suited for largescale deployments in central office sites. Flexible xDSL provisioning to server residential and business coverage. Service aware for all application demands such as Internet access, streaming audio and video, VoD, IPTV, and VoIP applications.
IES-5005 3.5U Remote MSAN 4 slots	• Remote & temperature-hardened • Chassis based & hot swappable • Ring or tree topology • DHCP/PPPoE/PPPoA • 4 SFP + 2 100/1000Base-T • ADSL2+, VDSL2, G.SHDSL.bis, VoIP and fiber-based Ethernet line cards • Multicast/Unicast IPTV service • PSTN service replacement	For maximum 288-port density in space-limited environments and requiring chassis-based DSLAMs. Suitable for a central office or remote site to fulfill users with high-bandwidth demand such as Internet access, streaming audio and video, VoD, IPTV, and multimedia applications. Enhanced backplane capacity for VDSL2 provisioning.
IES-1248 1.5U Remote DSLAM	• Remote & temperature-hardened • Stand-alone & built-in splitter • Ring or tree topology • DHCP/PPPoE/PPPoA • Wire speed & redundant uplink • Hot swappable fan • Multicast/Unicast IPTV service • Triple play services • 2 Gigabit SFP/Copper Combo 48 ports ADSL2+	Typical FTTC/FTTB deployment for up to 144 ports per PoP density or for NGN IP migration. Temperature-hardened for setting up networks in remote locations to maximize ADSL bandwidth. Advanced QoS features for Internet access, streaming audio and video, online gaming, VoD, IPTV, and multimedia applications.
IES-1248-51V 1.5U Remote MSAN 2 Gigabit SFP/Copper Combo 48 ports ADSL2+/VoIP	• Remote & temperature-hardened • Stand-alone & splitter built-in • Ring or tree topology • DHCP/PPPoE/PPPoA • Wire speed & redundant uplink • Hot swappable fan • Multicast/Unicast IPTV service • PSTN service replacement (SIP, H.248) • 2 Gigabit SFP/Copper Combo 48 ports ADSL2+/VoIP	Focusing on future benefit of IMS IP core that Access Gateway is expecting to replace traditional class 4, class 5 switches via VoIP. Medium-size for density lower than 48 ports that two mature technology ADSL2+ and VoIP could be deployed at the same port. Aim for new community as well as business model of two play services. Full control of VoIP service at the CO site.
IES-1000 1U Remote MSAN 2 slots	• Low density & multi-services • AC/DC power input • Max. 24-port ADSL2+ • Max. 32-port G.SHDSL.bis • Max. 48-port VoIP (SIP)	Application that requires low density connections but needs the flexibility of multi-services. Perfect solution for government wide area broadband coverage deployment campaign.
IES-612-51 1U Compact DSLAM	• Low density ADSL2+ solution • AC/DC power input • Max. 12-port ADSL2+	Perfect solution for entry level and low-density ADSL2+ solution deployment areas.
IES-708-22A 1U Compact DSLAM	• Low density G.SHDSL solution • AC power input • Max. 8-port G.SHDSL.bis • ATM-based Multi-Pair Bonding (G.998.1) support • Support STU-C and STU-R modes	Perfect solution for entry level and low-density G.SHDSL solution deployment areas.
VES-1616FT **VES-1624FT** 1.5U Remote DSLAM	• Remote & temperature-hardened • Stand-alone & splitter built-in • Low density VDSL2+ solution • AC/DC power input • 2 Gigabit SFP/Copper Combo 16/24-port VDSL2+	Typical FTTC/FTTB deployment for up to 16/24 ports per PoP density or for NGN IP migration. Temperature-hardened for setting up networks in remote locations to maximize VDSL bandwidth. Advanced QoS features for Internet access, streaming audio and video, online gaming, VoD, IPTV, and multimedia applications.
VES-1608FE **VES-1616FE** Remote DSLAM	• Remote & environmental-hardened • Stand-alone & splitter built-in • Low density VDSL2+ solution • AC power input • 2 Gigabit SFP/Copper Combo 8/16-port VDSL2 • Fanless	Typical FTTC/FTTB deployment for up to 8/16 ports per PoP density or for NGN IP migration. Environmental-hardened for setting up networks in outdoors locations to maximize VDSL bandwidth. Advanced QoS features for Internet access, streaming audio and video, online gaming, VoD, IPTV, and multimedia applications.
OLT-1308S-22 1U Mini Chassis OLT 3 slots	• Central, high capacity • Mini chassis, hot swappable PON, DC power and FAN module • AC or DC power input • 2 GE RJ45 + 2 GE Combo ports • Max. 256 ONU	Typical FTTB/FTTH deployment for up to 8 OLT ports, up to 256 ONU with Flexible chassis design to optimize OPEX. Built-in L2 switch simplifies traffic aggregation and deployment.
ONU-2024-21 1U Remote MDU	• Remote, AC power input • Port-based and Tag-based (IEEE 802.1Q) VLAN • IGMP snooping • 1 PON uplink with 24 ports FE	Perfect multi-dwelling-unit (MDU) solution for fast high bandwidth service roll-out

System	Main Chassis	Splitter Chassis	Management and Switching Card	Line Card	Splitter Card
IES-6000	IES-6000M	IES-3016ST	MSC1024G MSC1224G (10G)	ALC1248G-51 ALC1248G-53 ALC1272G-51 ELC1220G-55 IMA1408G-81 SLC1248G-22 SLC1348G-22 VLC1324G-51 VLC1324G-53 VLC1348G-51 VLC1424G-56 VOP1248G-61 (SIP) VOP1248G-61 (H.248) VOP1272G-61 (SIP)(Future) VOP1272G-61 (H.248)(Future)	ASC1224-61 ASC1224-63U SEC1224 VSC1224-1 VSC1224-43U
IES-5000	IES-5000M	IES-5000ST	MSC1000G	ALC1248G-51 ALC1248G-53 ALC1272G-51 ELC1220G-55 IMA1408G-81 SLC1248G-22 SLC1348G-22 VLC1324G-51 VLC1324G-53 VLC1348G-51 VLC1424G-56 VOP1248G-61 (SIP) VOP1248G-61 (H.248) VOP1272G-61 (SIP)(Future) VOP1272G-61 (H.248)(Future)	ASC1024-61 ASC1024-63/63U SEC1024 VSC1024-41
IES-5005	IES-5005M	IES-5005ST	MSC1000G	ALC1248G-51 ALC1248G-53 ALC1272G-51 ELC1220G-55 IMA1408G-81 SLC1248G-22 SLC1348G-22 VLC1324G-51 VLC1324G-53 VLC1348G-51 VLC1424G-56 VOP1248G-61 (SIP) VOP1248G-61 (H.248) VOP1272G-61 (SIP)(Future) VOP1272G-61 (H.248)(Future)	ASC1024-61 ASC1024-63/63U SEC1024 VSC1024-41
IES-1248	IES-1248-51 (DC) IES-1248-53 (DC) IES-1248-51A (AC)	-	-	(built-in)	(built-in)
	IES-1248-51V (DC)	-	-	(built-in)	(built-in)
IES-1000	IES-1000 (DC) IES-1000 (AC)	-	-	AAM1212-51 AAM1212-53 SAM1216-22 SAM1316-22 VOP1224-61	(built-in)
IES-612-51 **IES-612-51A**	Standalone ADSL2+ Compact DSLAM	-	-	(built-in)	(built-in)
IES-708-22A	Standalone G.SHDSL Compact DSLAM	-	-	(built-in)	-

Model No.	IES-612-51	IES-708-22A	IES-1000	IES-1248-51/53
System Overview				
Category	Compact DSLAM (ADSL2+ only)	Compact DSLAM (G.SHDSL.bis only)	Remote MSAN (ADSL2+, G.SHDSL.bis & VoIP)	Remote MSAN (ADSL2+ only)
Dimensions W x D x H (mm)	270 x 350 x 44	270 x 350 x 44	440 x 320 x 44	440 x 250 x 66
Splitter	Built-in	-	Built-in	-
Rack Mountable	19" 1U	19" 1U	19" 1U	19" 1U
Total Slots	Standalone	Standalone	2	Standalone
Max. xDSL Slots	Standalone	Standalone	2	Standalone
Max. xDSL Ports	12	8	24/32/48	48
Management & Switching Card Redundancy	-	-	-	-
Power Input	AC or DC	AC	AC or DC	AC or DC
Power Redundancy	-	-	-	-
Hot Swappable	-	-	Yes	-
Interfaces				
Uplink	2FE	2FE	2FE	2 100/1000Base-T or 2 Mini GBIC
Subtending	Yes	Yes	Yes	Yes
ADSL2/2+ Line Card	Yes	-	Yes	Yes
G.SHDSL.bis Line Card	-	Yes	Yes	-
VDSL2 Line Card	-	-	-	-
VoIP Line Card	-	-	Yes	-
Ethernet Line Card	-	-	-	-
E1 Line Card	-	-	-	-
ADSL2/2+				
Annex M	Yes	-	Yes	Yes
SRA	Yes	-	Yes	Yes
INP (Min=2)	Yes	-	Yes	Yes
SELT	Yes	-	Yes	Yes
DELT	Yes	-	Yes	Yes
ADSL2+ Bonding	Yes	-	Yes	Yes
G.SHDSL				
N-wire Bonding (G.991.2)	-	Yes	Yes	-
ATM-based Multi-Pair Bonding (G.998.1)	-	Yes	Yes	-
IEEE 802.3-2004 (EFM)	-	-	Yes	-
VDSL2				
DS/US Speed (Mbps)	-	-	-	-
Max. Ports	-	-	-	-
ADSL2+ Fallback	-	-	-	-
CFM (802.1ag)	-	-	-	-
SELT	-	-	-	-
DELT	-	-	-	-
VoIP				
Signaling Protocol	-	-	SIP	-
Voice Codec (G.711a/u, G.723, G.726, G.729ab)	-	-	Yes	-
Metallic Line Test (MLT)	-	-	Yes	-
DTMF	-	-	Yes	-
Fax/Modem (T.38)	-	-	Yes	-
Call Waiting/Hold/Transfer	-	-	Yes	-
Dial Tone, Ringing Tone, Busy Tone	-	-	Yes	-
QoS Function				
802.1p	4 queue	4 queue	4 queue	4 queue
802.1q (VLAN#)	256	256	256	1024
SPQ/WRR	SPQ	SPQ	SPQ	SPQ
Security Function				
IEEE 802.1x	Yes	Yes	Yes	Yes
Multiple PVC	8	8	8	8
Q in Q (VLAN Stacking)	Yes	Yes	Yes	Yes
DHCP Snooping	Yes	Yes	Yes	Yes
DHCP Relay Option 82	Yes	Yes	Yes	Yes
MAC/Packet Filtering	Yes	Yes	Yes	Yes
MAC Count Filtering	Yes	Yes	Yes	Yes
802.3ad Link Aggregation	-	-	-	-
IP Bridge	-	-	-	Yes
Multicast Function				
IGMP v1/ v2/v3 Snooping	Yes (no. v3)	Yes (no. v3)	Yes	Yes
IGMP v1/ v2/v3 Proxy	Yes (no. v3)	Yes (no. v3)	Yes	Yes
IGMP v1/ v2/v3 Multicast Group	256	256	256	512
Static Multicast	Yes	Yes	Yes	Yes
Multicast VLAN	Yes	Yes	Yes	Yes
Network Management				
SNMP v1, v2	Yes	Yes	Yes	Yes
SNMP v3	-	-	-	-
Web Management	Yes	Yes	Yes	Yes
CLI Management	Yes	Yes	Yes	Yes
EMS Management	NetAtlas Access	NetAtlas Access	NetAtlas Access	NetAtlas Access

Model No.	IES-1248-51V	IES-5005	IES-5000	IES-6000
System Overview				
Category	Remote MSAN (Both ADSL2+ & VoIP)	Remote MSAN (ADSL2+, VoIP, G.SHDSL.bis, VDSL2, Active Fiber-base Ethernet)	Central MSAN (ADSL2+, VoIP, G.SHDSL.bis, VDSL2, Active Fiber-base Ethernet)	Central MSAN (ADSL2+, VoIP, G.SHDSL.bis, VDSL2, Active Fiber-base Ethernet)
Dimensions W x D x H (mm)	440 x 250 x 66	440 x 250 x 152	440 x 285 x 289	440 x 285 x 544
Splitter	Built-in	Separated, IES-5005ST	Separated, IES-5005ST	Separated, IES-3016ST
Rack Mountable	19" 1.5U	19" 3.5U	19" 6.5U	19" 12.5U
Total Slots	Standalone	5	10	17
Max. xDSL Slots	Standalone	4	8	16
Max. xDSL Ports	48	288	576	1152
Management & Switching Card Redundancy	-	-	Yes	Yes
Power Input	DC	DC	DC	DC
Power Redundancy	-	Yes	Yes	Yes
Hot Swappable	-	Yes	Yes	Yes
Interfaces				
Uplink	2 100/1000Base-T or 2 Mini GBIC	4GE	4GE	8GE or 2 x 10G + 6 x GE
Subtending	Yes	Yes	Yes	Yes
ADSL2/2+ Line Card	Yes	Yes	Yes	Yes
G.SHDSL.bis Line Card	-	Yes	Yes	Yes
VDSL2 Line Card	-	Yes	Yes	Yes
VoIP Line Card	Built-in	Yes	Yes	Yes
Ethernet Line Card	-	Yes	Yes	Yes
E1 Line Card	-	Yes	Yes	Yes
ADSL2/2+				
Annex M	Yes	Yes	Yes	Yes
SRA	Yes	Yes	Yes	Yes
INP (Min=2)	Yes	Yes	Yes	Yes
SELT	Yes	Yes	Yes	Yes
DELT	Yes	Yes	Yes	Yes
ADSL2+ Bonding	Yes	Yes	Yes	Yes
G.SHDSL				
N-wire Bonding (G.991.2)	-	Yes	Yes	Yes
ATM-based Multi-Pair Bonding (G.998.1)	-	Yes	Yes	Yes
IEEE 802.3-2004 (EFM)	-	Yes	Yes	Yes
VDSL2				
DS/US Speed (Mbps)	-	100/100	100/100	100/100
Max. Ports	-	24/48	24/48	24/48
ADSL2+ Fallback	-	Yes	Yes	Yes
CFM (802.1ag)	-	Yes	Yes	Yes
SELT	-	Yes	Yes	Yes
DELT	-	Yes	Yes	Yes
VoIP				
Signaling Protocol	SIP, H.248	SIP, H.248	SIP, H.248	SIP, H.248
Voice Codec (G.711a/u, G.723, G.726, G.729ab)	Yes	Yes	Yes	Yes
Metallic Line Test (MLT)	Yes	Yes	Yes	Yes
DTMF	Yes	Yes	Yes	Yes
Fax/Modem (T.38)	Yes	Yes	Yes	Yes
Call Waiting/Hold/Transfer	Yes	Yes	Yes	Yes
Dial Tone, Ringing Tone, Busy Tone	Yes	Yes	Yes	Yes
QoS Function				
802.1p	4 queue	8 queue	8 queue	8 queue
802.1q (VLAN#)	1024	4k	4k	4k
SPQ/WRR	SPQ	SPQ, WRR	SPQ, WRR	SPQ, WRR
Security Function				
IEEE 802.1x	Yes	Yes	Yes	Yes
Multiple PVC	8	8	8	8
Q in Q (VLAN Stacking)	Yes	Yes	Yes	Yes
DHCP Snooping	Yes	Yes	Yes	Yes
DHCP Relay Option 82	Yes	Yes	Yes	Yes
MAC/Packet Filtering	Yes	Yes	Yes	Yes
MAC Count Filtering	Yes	Yes	Yes	Yes
802.3ad Link Aggregation	-	Yes	Yes	Yes
IP Bridge	Yes	Yes	Yes	Yes
Multicast Function				
IGMP v1/ v2/v3 Snooping	Yes	Yes	Yes	Yes
IGMP v1/ v2/v3 Proxy	Yes	Yes	Yes	Yes
IGMP v1/ v2/v3 Multicast Group	512	256	256	1K
Static Multicast	Yes	Yes	Yes	Yes
Multicast VLAN	Yes	Yes	Yes	Yes
Network Management				
SNMP v1, v2	Yes	Yes	Yes	Yes
SNMP v3	-	Yes	Yes	Yes
Web Management	Yes	Yes	Yes	Yes
CLI Management	Yes	Yes	Yes	Yes
EMS Management	NetAtlas Access	NetAtlas Access	NetAtlas Access	NetAtlas Access

MSAN/DSLAM
Feature Matrix

Model No.		VES-1624FT-55A	VES1616/1624FT-54	VES-1608/1616FE-53A/ VES-1616FE-55A
System Overview				
Category		Remote DSLAM	Remote DSLAM	Remote DSLAM
Dimensions W x D x H (mm)		440 x 250 x 66	440 x 250 x 66	380 x 390 x 104
Splitter		Built-in	Built-in	Built-in
Rack Mountable		19" 1.5U	19" 1.5U	-
Max. xDSL Ports		24	16/24	8/16
Power Input		AC or DC	AC 100 ~ 240 V/DC -36 ~ -72 V	AC 100 ~ 240 V
Interfaces				
Uplink		2 100/1000Base-T or 2 Mini GBIC	2 100/1000Base-T or 2 Mini GBIC	2 100/1000Base-T or 2 Mini GBIC
Subtending		Yes	Yes	Yes
ADSL2/2+				
Annex M		Yes	-	Yes
SRA		Yes	-	Yes
INP (Min=2)		Yes	-	Yes
SELT		Yes	-	Yes
DELT		Yes	-	Yes
ADSL2+ Bonding		-	-	-
VDSL2				
DS/US Speed (Mbps)		100/50	100/50	100/50
ADSL2+ Fallback		Yes	-	Yes
SELT		Yes	Yes	Yes
DELT		Yes	Yes	Yes
VoIP				
Signaling Protocol		-	-	-
Voice Codec (G.711a/u, G.723, G.726, G.729ab)		-	-	-
Metallic Line Test (MLT)		-	-	-
DTMF		-	-	-
Fax/Modem (T.38)		-	-	-
Call Waiting/Hold/Transfer		-	-	-
Dial Tone, Ringing Tone, Busy Tone		-	-	-
QoS Function				
802.1p		8 queue	8 queue	8 queue
802.1q (VLAN#)		4K	4K	4K
SPQ/WRR/WFQ		SPQ	SPQ	SPQ
Security Function				
IEEE 802.1x		Yes	Yes	Yes
Multiple PVC		4 (ADSL fall back)	-	4 (ADSL fall back)
Q in Q (VLAN Stacking)		Yes	Yes	Yes
DHCP Snooping		Yes	Yes	Yes
DHCP Relay Option 82		Yes	Yes	Yes
MAC/Packet Filtering		Yes	Yes	Yes
MAC Count Filtering		Yes	Yes	Yes
802.3ad Link Aggregation		Yes	Yes	Yes
IP Bridge		Yes	Yes	Yes
Multicast Function				
IGMP v1/ v2/v3	Snooping	Yes	Yes	Yes
	Proxy	Yes	Yes	Yes
	Multicast Group	512	1K	512
Static Multicast		Yes	Yes	Yes
Multicast VLAN		Yes	Yes	Yes
Network Management				
SNMP v1, v2		Yes	Yes	Yes
SNMP v3		Yes	Yes	Yes
Web Management		Yes	Yes	Yes
CLI Management		Yes	Yes	Yes
CFM (802.1ag)		Yes	Yes	Yes
EMS Management		NetAtlas Access	-	NetAtlas Access

MSAN/DSLAM
Product Description

IES-6000	Descriptions
IES-6000M	IES-6000 main chassis with 16 slots, two slots for MSC1024G cards and 15/16 slots for line cards, DC power input Dimensions: 440 (W) x 285 (D) x 544 (H) mm
MSC1024G	Management and switching card with 8 GE uplink ports
MSC1224G	Management and switching card with two 10G and 6 Gigabit Ethernet uplink ports
ALC1248G-51	48-port Annex A ADSL2/ADSL2+ line card (over POTS)
ALC1248G-53	48-port Annex B ADSL2/ADSL2+ line card (over ISDN)
ALC1272G-51	72-port Annex A ADSL2/ADSL2+ line card (over POTS)
ELC1220G-55	20-port Fast Ethernet SFP (100Base-FX, 100Base-BX, and 100Base-LX)
IMA1408G-81	8-port E1 IMA line card
SLC1248G-22	48-port G.SHDSL/G.SHDSL.bis line card
SLC1348G-22	48-port EFM/ATM G.SHDSL/G.SHDSL.bis line card
VLC1324G-51	24-port DMT-based VDSL2 line card (Annex A, 17a profile)
VLC1324G-53	24-port DMT-based VDSL2 line card (Annex B, 17a profile)
VLC1348G-51	48-port DMT-based 5-band VDSL2 line card (17a profile)
VOP1248G-61 (SIP)	48-port VoIP line card with supporting SIP
VOP1248G-61 (H.248)	48-port VoIP line card with supporting H.248
VOP1272G-61 (SIP)(future)	72-port VoIP line card with supporting SIP
VOP1272G-61 (H.248)(future)	72-port VoIP line card with supporting H.248
IES-3016ST	IES-3016ST splitter chassis with 16 slots for 24 port splitter cards. 3 x 3016ST to support full-loaded ALC1272G-51 line cards at IES-6000M. 2 x 3016ST to support full-loaded ALC1248G-51 line cards at IES-6000M. DImensions: 440 (W) x 355 (D) x 220 (H) mm
ASC1224-61	24-port Annex A ADSL/ADSL2+ splitter card (over POTS)
ASC1224-63U	24-port Annex B ADSL/ADSL2+ splitter card (over ISDN)
SEC1224	24-port extension card for G.SHDSL or VoIP line card
VSC1224-41	24-port DMT-based 5-band VDSL2 splitter card (over POTS)
VSC1224-43U	24-port VDSL2 universal splitter card (Over POTS and ISDN)

IES-5000	Descriptions
IES-5000M	IES-5000 main chassis with 10 slots, 8 slots for line cards and 2 slots for MSC cards for redundancy, DC power input Dimensions: 440 (W) x 285 (D) x 289 (H) mm
MSC1000G	Management and switching card with 4 GE uplink/subtending ports
ALC1248G-51	48-port Annex A ADSL2/ADSL2+ line card (over POTS)
ALC1248G-53	48-port Annex B ADSL2/ADSL2+ line card (over ISDN)
ALC1272G-51	72-port Annex A ADSL2/ADSL2+ line card (over POTS)
ELC1220G-55	20-port Fast Ethernet SFP (100Base-FX, 100Base-BX, and 100Base-LX)
IMA1408G-81	8-port E1 IMA line card
SLC1248G-22	48-port G.SHDSL/G.SHDSL.bis line card
SLC1348G-22	48-port EFM/ATM G.SHDSL/G.SHDSL.bis line card
VLC1324G-51	24-port DMT-based VDSL2 line card (Annex A, 17a profile)
VLC1324G-53	24-port DMT-based VDSL2 line card (Annex B, 17a profile)
VLC1348G-51	48-port DMT-based 5-band VDSL2 line card (17a profile)
VOP1248G-61 (SIP)	48-port VoIP line card with supporting SIP protocol
VOP1248G-61 (H.248)	48-port VoIP line card with supporting H.248 protocol
VOP1272G-61 (SIP)(future)	72-port VoIP line card with supporting SIP
VOP1272G-61 (H.248)(future)	72-port VoIP line card with supporting H.248
IES-5000ST	IES-5000 splitter chassis with 16 slots for 24-port POTS/ISDN splitter cards. The splitter card uses a telco-50 (RJ-21) cable that connects to xDSL subscriber interface module for xDSL services. The other connector links to MDF for POTS or ISDN access. Dimensions: 440 (W) x 355 (D) x 240 (H) mm
ASC1024-61	24-port Annex A ADSL/ADSL2+ splitter card (over POTS)
ASC-1024-63	24-port Annex B ADSL/ADSL2+ splitter card (over ISDN)
ASC-1024-63U	24-port ADSL/ADSL2+ universal splitter card (over POTS/ISDN)
SEC1024	24-port extension card for G.SHDSL or VoIP line card
VSC1024-41	24-port DMT-based 5-band VDSL2 splitter card (over POTS)

MSAN/DSLAM
Product Description

IES-5005	Descriptions
IES-5005M	IES-5005 main chassis with 5 slots, 4 slots for line cards and 1 slot for MSC cards, DC power input Dimensions: 440 (W) x 250 (D) x 152 (H) mm
MSC1000G	Management and switching card with 4 GE uplink/subtending ports
ALC1248G-51	48-port Annex A ADSL2/ADSL2+ line card (over POTS)
ALC1248G-53	48-port Annex B ADSL2/ADSL2+ line card (over ISDN)
ALC1272G-51	72-port Annex A ADSL2/ADSL2+ line card (over POTS)
ELC1220G-55	20-port Fast Ethernet SFP (100Base-FX, 100Base-BX, and 100Base-LX)
IMA1408G-81	8-port E1 IMA line card
MSC1000G	Management and switching card with 4 GE uplink/subtending ports
SLC1248G-22	48-port G.SHDSL/G.SHDSL.bis line card
SLC1348G-22	48-port EFM/ATM G.SHDSL/G.SHDSL.bis line card
VLC1324G-51	24-port DMT-based VDSL2 line card (Annex A, 17a profile)
VLC1324G-53	24-port DMT-based VDSL2 line card (Annex B, 17a profile)
VLC1348G-51	48-port DMT-based 5-band VDSL2 line card (17a profile)
VOP1248G-61 (SIP)	48-port VoIP line card with supporting SIP protocol
VOP1248G-61 (H.248)	48-port VoIP line card with supporting H.248 protocol
VOP1272G-61 (SIP)(future)	72-port VoIP line card with supporting SIP
VOP1272G-61 (H.248)(future)	72-port VoIP line card with supporting H.248
IES-5005ST	IES-5005 splitter chassis with 8 slots for 24-port POTS/ISDN splitter cards. The splitter card uses a telco-50 (RJ-21) cable that connects to the xDSL subscriber interface module for xDSL services. The other connector links back to MDF for POTS or ISDN access. Dimensions: 440 (W) x 355 (D) x 124 (H) mm
ASC1024-61	24-port Annex A ADSL/ADSL2+ splitter card (over POTS)
ASC-1024-63	24-port Annex B ADSL/ADSL2+ splitter card (over ISDN)
ASC-1024-63U	24-port ADSL/ADSL2+ universal splitter card (over POTS/ISDN)
SEC1024	24-port extension card for G.SHDSL or VoIP line card
VSC1024-41	24-port DMT-based 5-band VDSL2 splitter card (over POTS)

IES-1248	Descriptions
IES-1248-51 (DC)	IES-1248 enclosure with 48-port Annex A ADSL2+ line and splitter over POTS, DC power input with temperature-hardened design Dimensions: 440 (W) x 250 (D) x 66 (H) mm
IES-1248-53 (DC)	IES-1248 enclosure with 48-port Annex B ADSL2+ line and splitter over ISDN, DC power input with temperature-hardened design Dimensions: 440 (W) x 250 (D) x 66 (H) mm
IES-1248-51A (AC)	IES-1248 enclosure with 48-port Annex A ADSL2+ line and splitter over POTS, AC power input Dimensions: 440 (W) x 250 (D) x 66 (H) mm
IES-1248-51V (DC)	IES-1248 enclosure with 48-port Annex A ADSL2+ and POTS line, DC power input Dimensions: 440 (W) x 250 (D) x 66 (H) mm

IES-1000	Descriptions
IES-1000 (DC)	IES-1000 enclosure with two slide-in slots for DSL/VOP modules, DC power input Dimensions: 440 (W) x 320 (D) x 44 (H) mm
IES-1000 (AC)	IES-1000 enclosure with two slide-in slots for DSL/VOP modules, AC power input Dimensions: 440 (W) x 320 (D) x 44 (H) mm
AAM1212-51	12-port Annex A ADSL2+ module (over POTS) with splitters built-in
AAM1212-53	12-port Annex B ADSL2+ module (over ISDN) with splitters built-in
SAM1216-22	16-port G.SHDSL.bis module
SAM1316-22	16-port EFM/ATM G.SHDSL.bis module
VOP1224-61	24-port VoIP module (SIP)

IES Compact	Descriptions
IES-612-51	12-port ADSL2+ standalone Compact DSLAM, DC or AC power input Dimensions: 270 (W) x 350 (D) x 44 (H) mm
IES-708-22A	8-port G.SHDSL standalone Compact DSLAM, AC power input Dimensions: 270 (W) x 350 (D) x 44 (H) mm

VES	Descriptions
VES-1616/1624FT-54	16/24-port VDSL2 temperature-harden, DSLAM (over POTS) with ANSI splitter built-in, AC/DC power input Dimensions: 440 (W) x 250 (D) x 66 (H) mm
VES-1624FT-55A	24-port VDSL2 temperature-harden, DSLAM (over POTS) with ETSI splitter built-in, AC or DC power input Dimensions: 440 (W) x 250 (D) x 66 (H) mm
VES-1608/1616FE-53A	8/16-port VDSL2 environmental-harden, DSLAM (over ISDN) with ETSI splitter built-in, AC power input Dimensions: 380 (W) x 104 (D) x 390 (H) mm
VES-1616FE-55A	16-port VDSL2 environmental-harden, DSLAM (over POTS) with ETSI splitter built-in, AC power input Dimensions: 380 (W) x 104 (D) x 390 (H) mm

Certificate

EMC/ESD
- FCC Part 15 Class A
- EN55022 Class A
- EN55024 Class A
- ETS300 386
- NEBS

Safety
- ITU-T K.20, Appendix C
- CSA 60950
- EN60950
- IEC60950
- UL60950
- NEBS

Reliability
- ETS300 019

Fiber Access

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OLT-1308S-22

8-port GEPON Optical Line Terminal + L2 Switch

Broadband Passive Optical Networks Enriching Access Network Services

- 8 IEEE 802.3ah-compliant GEPON ports
- 4 GbE uplink ports (1000Base-T/1000Base-SX/LX)
- Wavelength: 1310 nm for upstream, 1490 nm for downstream
- IP QoS support: VLAN, multicast and priority queue
- Advanced security: 802.1x port authentication, IGMP v1/v2 snooping and Filtering, AES algorithm with 128-bit encryption

Compatible end device

ONU-6040B-22/21
GEPON Optical Network Unit
4FE switch

ONU-6040BF-22
GEPON Optical Network Unit
4FE + RF overlay

ONU-6100B-22/21
GEPON Optical Network Unit
1GE LAN

OLT-1308S-22
8-port 802.3ah 1U mini chassis GEPON OLT + L2 Switch

Advantage

The OLT-1308S-22 GEPON system (Optical Line Termination, OLT) is located in the operator's central office and different types of ONU (Optical Network Unit, ONU) are located at customer premises for FTTB/H connections. The OLT-1308S-22 is connected by a single fiber to an optical power splitter that supplies the optical signal to as many as 256 sets of ONUs (each OLT PON port supports up to 32 ONU sets). The OLT-1308S-22 is a mini chassis with a Layer-2 GEPON switch featuring 8 GEPON ports (3 PON modules), 4 Gigabit uplink ports (2 copper and 2 combo ports) and one 10/100 Mbps Ethernet port for out-of-band management. For CPE compatibility, ZyXEL provides several models for different network architecture needs.

Specifications

Network interfaces	8 IEEE 802.3ah-compliant GEPON ports 4 GbE uplink ports (1000Base-T/1000Base-SX/LX)
Redundancy	802.3ad link aggregation
Quality of Service	IEEE 802.1p QoS with 8 priority queues per port, IEEE 802.1Q tag-based VLAN, 2K static VLAN, up to 4K dynamic VLAN, VLAN trunking, supports to GVRP, automatic VLAN member registration, IGMP v1, v2 & v3
Management	Web GUI, Telnet, FTP, CLI, SNMP, SSH support, RS-232 local console, Out of band management, EMS
Special features	Hot swappable line card, DC power module and FAN modules
Mounting	19" rackmount, 1 U
Power supply	100 ~ 240 V AC, 48 V DC
Dimensions	440 x 312 x 44 mm (WxDxH)

ONU 6000 Series

GEPON Optical Network Unit

Broadband Passive Optical Networks Enriching Access Network Services

- 1 IEEE 802.3ah-compliant GEPON port
- 4 10/100Base-TX ports (IEEE 802.3, IEEE 802.3u, ONU-6040B-21/22)
- 1 10/100/1000Based-TX port (IEEE 802.3, IEEE 802.3u, ONU-61000B-21/22)
- 10 km or 20 km service distance
- 1550 nm RF overlay (ONU-6040BF-22)
- Supports remote control from OAM channel and data loopback test
- IP QoS support: VLAN, multicast, priority queue and 802.1x

ONU-6040B-21/22
GEPON Optical Network Unit + 4-port Switch

ONU-6040BF-22
GEPON Optical Network Unit + 4-port Switch & RF overlay

ONU-6100B-21/22
GEPON Optical Network Unit + 1-port Gigabit LAN port

Specifications

Network interfaces	1 IEEE 802.3ah-compliant GEPON port 4 10/100Base-TX ports (IEEE 802.3, IEEE 802.3u, ONU-6040B-21/22) 1 10/100/1000Based-TX port (IEEE 802.3, IEEE 802.3u, ONU-61000B-21/22) 1550 nm RF overlay (ONU-6040BF-22)
Quality of Service	802.1p (4 priority queues) 802.1q Tag-based VLAN, 802.3x flow control
Power supply	100 ~ 240 V, 12 V DC/1.5 A (ONU-61000B-21/22 & ONU-6040B-21/22) 12 VDC/1 A (ONU-6040BF-22)
Green	EuP, WEEE & RoHS
Dimensions	188 x 120 x 30 mm (WxDxH) (ONU-61000B-21/22 & ONU-6040B-21/22) 181 x 123 x 36 mm (WxDxH) (ONU-6040BF-22)

ONU5100-B22

SFP EPON Optical Network Unit

Broadband Passive Optical Networks Enriching Access Network Services

- GEPON port with SC connector
- 1310 nm upstream/1490 nm downstream
- 20 km (1000Base-PX-20U) long-distance coverage
- Compliant with IEEE 802.3ah
- 128-bit AES supported

ONU5100-B22
SFP EPON Optical Network Unit

Specifications

Network interfaces	1 IEEE 802.3ah-compliant GEPON port
Reach	20 km (1000Base-PX-20U) long-distance coverage
Security	128-bit AES supported
Dimensions	68 x 14 x 12 mm (WxDxH)

ONU-2024-21

GEPON Access Switch for FTTX Service Network (MDU)

Broadband Passive Optical Networks Enriching Access Network Services

- 1 IEEE 802.3ah-compliant GEPON port
- 1 dual-personality GbE port for long-loop and high bandwidth cascading applications
- 24 Fast Ethernet Ports with Auto-negotiation and Auto-MDIX
- Rich multicast features: IGMP snooping, MVR
- Advanced security; 802.1x port authentication, MAC filtering, MAC freeze, VLAN isolation, limited MAC per port

ONU-2024-21
24-port Access Switch with one GEPON uplink for FTTX Service Network (MDU)

Specifications

Network interfaces	1 IEEE 802.3ah-compliant GEPON port 1 dual-personality GbE port
System functions	IP QoS support: VLAN, SPR, WRR, DSCP to 802.1p mapping, traffic shaping, Rich multicast features: IGMP snooping, MVR
Quality of Service	IEEE 802.1p with 4 priority queues per port for different types of traffic, WRR (Weighted Round Robin)/SPQ, scheduling algorithm, DSCP to 802.1p priority mapping, IGMP snooping, MVR, Congestion control on al ports, Rate limiting: port-based bandwidth control, 64 kbps granularity, Port-based egress traffic shaping, Broadcast storm control
Management	Web-based management, Telnet CLI, SNMP v2c, RS-232c local console, IP management: static IP or DHCP client, RMON: four RMON group 1, 2, 3, 9 (history statistic, alarms, and events) for enhanced traffic management, monitoring, and analysis, Port mirroring: supports source/destination/both port mirroring
Special features	24 FE ports, Power saving mode
Mounting	19" rack mount, 1U
Power supply	100 ~ 240 V AC
Dimensions	440 x 173 x 44 mm (WxDxH)

P-3202HN-Ba

GPON IAD with CATV

GPON RGW Providing Unprecedented User Experiences

- FTTH Optical Fiber Access
- WLAN 11n with MIMO (up to 300 Mbps)
- Stateful Packet Inspection Firewall
- Quality of Service
- Cable Television Service
- Fiber Tray Design for Easy Installation

P-3202HN-Ba
GPON VoIP IAD, 802.11n, 4-port switch, SPI firewall, SIP with 2 FXS ports, CATV support

The P-3202 Series provides GPON FTTH solution without legacy copper, which is ideal for Brownfield and Greenfield deployment. It's capable of standard GPON transmission with Dynamic Bandwidth Allocation (DBA). Besides, it integrates with four 10/100/1000 Mbps LAN interfaces, two FXS ports, optional drafted 802.11n WLAN, and optional F-connector for CATV service. Abundant bridging features and optional routing functions, such as NAT, Firewall, and traffic classification, are fully supported by the compact box. With DBA and Service Classification, the P-3202 products will bring better user experiences in multimedia services. Moreover, with the compliance with Broadband Forum TR-069, these models make easy plug-and-play installation come true. Furthermore, Voice Over IP (VoIP) facilitates inexpensive phone calls. Abundant VoIP call features also enable flexibility and multi-functions over phone. The series can provide unprecedented user experiences for Triple-Play service!

Specifications

Network interfaces	4 x Gigabit Ethernet LAN ports with auto MDI/MDIX
Internet connection	1 x SC/APC Optical Interface
WLAN features	Compatible with 802.11a/b/g/n
Telephone connections	2 x FXS port support with VoIP call via analog phone
Wavelength	1310 nm (Upstream),1490 nm (Downstream) 1550 nm (RF Overlay)
GPON features	ITU-T G.984.1/G.984.2/G.984.3/G.984.4 compliance 16 x T-CONTs
VoIP features	SIP (RFC 3261), extensive telephony functions, T.38 fax relay
Data transfer rate	WAN Upstream throughput: Downstream= 2.5 Gbps: 1.25 Gbps, WLAN 300 Mbps Ethernet LAN 1 Gbps
Security	GPON Downstream AES Encapsulation SPI firewall, NAT, DoS
Quality of Service	ITU-T G.984.3 DBA support 802.1p/q Operations (Modification, Deletion, Insertion)
Routing	IP Static Route, DHCP, DNS/DDNS, NAT, IGMP v1/v2, RIP v1/v2
Network management	GPON OMCI, Web GUI, Telnet, SSH, FTP, TR-069/ TR-098/TR-104
Special features	1 x F-Connector for Downstream CATV service Fiber Tray Design for Easy Installation and Flexibility
Power supply	18 V DC @1 A
Green	EuP, WEEE & RoHS
Dimensions	258 x 154 x 54 mm (WxDxH)

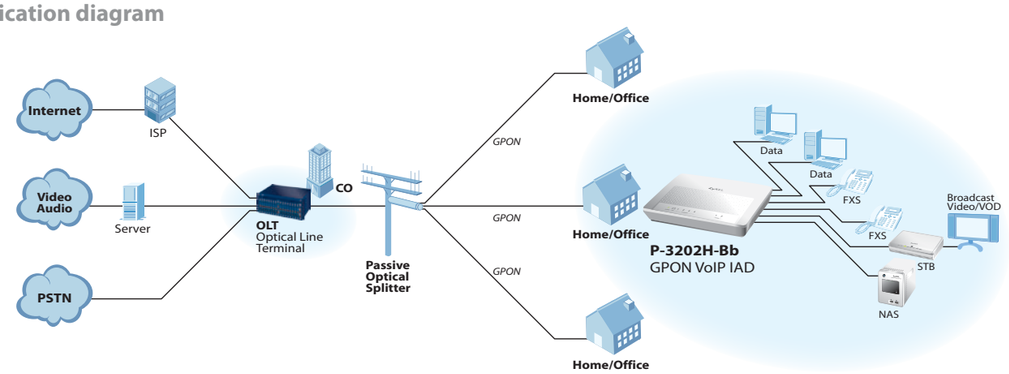
P-3202H-Bb

GPON Modem with VoIP

GPON IAD Bringing Triple-play Services with High Quality

- FTTH Optical Fiber Access
- 802.1D Self-learning Bridging
- Voice Over IP (VoIP) Support
- IGMP Snooping
- Dynamic Bandwidth Allocation
- Traffic Classification

Application diagram



P-3202H-Bb
GPON VoIP IAD, 4-port switch, SIP with 2 FXS ports

Specifications

Network interfaces	4 x Gigabit Ethernet LAN ports with auto MDI/MDIX
Internet connection	1 x SC/APC Optical Interface
Telephone connections	2 x FXS support with VoIP call via analog phone
Wavelength	1310 nm (Upstream),1490 nm (Downstream)
GPON features	ITU-T G.984.1/G.984.2/G.984.3/G.984.4 compliance 16 x T-CONTs
VoIP features	SIP (RFC 3261), extensive telephony functions
Data transfer rate	WAN Downstream throughput: Upstream= 2.5 Gbps: 1.25 Gbps, Ethernet LAN 1 Gbps
Security	GPON Downstream AES Encapsulation
Quality of Service	ITU-T G.984.3 DBA support 802.1p/q Operations (Modification, Deletion, Insertion)
Bridging	IEEE 802.3x Flow Control, IGMP v1/v2 Snooping
Network management	GPON OMCI, Web GUI, Telnet, SSH, FTP, TR-069/TR-104
Power supply	18 V DC @1 A
Green	EuP, WEEE & RoHS
Dimensions	219 x 145 x 40 mm (WxDxH)

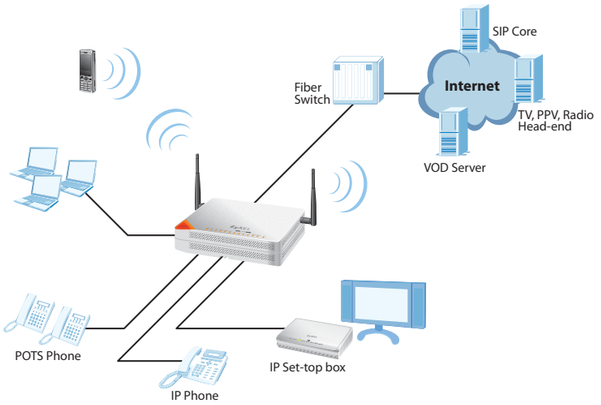
FSG2200HNU

Gigabit Active Fiber IAD with 802.11n Wireless

Future Proof Gigabit Active Fiber IAD for High Quality Triple-play Services

- Gigabit Fiber WAN Access
- Four GE ETH LAN
- 802.11n AP functions built-in (2x2)
- Advance QoS, VLAN, traffic shaping features for multi-media application
- Remote management through TR-069/098/104
- Plug-and-play with Fiber Termination Unit

Application diagram



FSG2200HNU
802.11 n Active Fiber GE IAD

FTU1000/FTU2000/FTU3000
Fiber Termination Unit

Specifications

WAN connection	1000Base-BX, SC/APC fiber connector
Bridge/Router functionality	RIP I/II, IP Policy Routing, IGMP v1/v2, DHCP Client/Server, NAT, DNS/DDNS
VoIP	2 FXS port, G.711/G.726/G.729
QoS/VLAN	Flexible Packet Classification, IEEE 802.1Q/1P, Traffic shaping, up to 4 priority queue
Wireless	IEEE 802.11n compliant, Data Rate: 300 Mbps Frequency Range: 2.4 GHz
Security & Firewall	SPI Firewall
Management	Web GUI, Telnet, FTP, TR-069/098/104
USB	2 USB port, Storage
Green	EuP, WEEE & RoHS
Others	UPnP, FTU support
Power supply	120 V/230 V/240 V, 12 V DC 1.5 A
Dimensions	254 x 153.9 x 41 mm (WxDxH) (FSG2200HNU) 254 x 153.9 x 49.9 mm (WxDxH) (FTU1000/FTU2000/FTU3000)

FSG2100HNU

100M Active Fiber IAD with 802.11n Wireless

FSG2100HNU
802.11n Active Fiber IAD

FTU1000/FTU2000/FTU3000
Fiber Termination Unit

Active Fiber IAD for FTTH Triple-play Services

- Active Fiber WAN Access
- Four 10/100 ETH LAN
- 802.11n AP functions built-in (2x2)
- Advance QoS, VLAN, traffic shaping features for multi-media application
- Remote management through TR-069/098/104
- Plug-and-play with Fiber Termination Unit

Specifications

WAN connection	100Base-BX, SC/APC fiber connector
Bridge/Router functionality	RIP I/II, IP Policy Routing, IGMP v1/v2, DHCP Client/Server, NAT, DNS/DDNS
VoIP	2 FXS port, G.711/G.726/G.729
QoS/VLAN	Flexible Packet Classification, IEEE 802.1Q/1P, Traffic shaping, up to 4 priority queue
Wireless	IEEE 802.11n compliant, Data Rate: 300 Mbps Frequency Range: 2.4 GHz
Security & Firewall	SPI Firewall
Management	Web GUI, Telnet, FTP, TR-069/098/104
USB	1 USB port, Storage
Green	EuP, WEEE & RoHS
Others	UPnP, FTU support
Power supply	120 V/230 V/240 V, 12 V DC 1.5 A
Dimensions	254 x 153.9 x 41 mm (WxDxH)(FSG2100HNU) 254 x 153.9 x 49.9 mm (WxDxH) (FTU1000/FTU2000/FTU3000)

FSG1100HN

100M Active Fiber Gateway with 802.11n Wireless

FSG1100HN
802.11n Active Fiber Gateway

Active Fiber GW for FTTH Multi-media Application

- Modular 100M Active fiber WAN with SC/LC/SFP interface
- 802.11n AP function built in (1x1)
- Effective bandwidth management for multi-media application
- Remote management through TR-069
- Easily click-on with built in fiber tray

Specifications

WAN connection	100Base-LX10, SC/LC/SFP fiber connector
Bridge/Router functionality	RIP I/II, IP Policy Routing, IGMP v1/v2, DHCP Client/Server, NAT
QoS/VLAN	IEEE 802.1Q/1P, Traffic Classification, Priority Management
Wireless	IEEE 802.11n compliant, Data Rate: 150 Mbps Frequency Range: 2.4 GHz
Security & Firewall	SPI Firewall
Management	Web GUI, Telnet, FTP, TR-069
Green	EuP, WEEE & RoHS
Others	Embedded fiber tray, Module design for fiber connector
Power supply	120 V/230 V/240 V, 12 V DC 1 A
Dimensions	200 x 140 x 40 mm (WxDxH)

Metro Switch 4000 Series

Metro Layer 3 Managed Switch
— Gigabit Ethernet

Intelligent Pro Gigabit Switching and Routing Solution for Corporate Networks

- L3 Advanced Routing Protocols, OSPF and RIP
- Policy-based QoS Optimizes Multi-service Quality
- Multicast DVMRP & IGMP Support
- Multilayer-aware (L2/L3/L4) ACL for Security Protection and Traffic Optimization
- Port Security and Enhanced 802.1x Port Authenticationt
- High Redundancy and Resilience Architecture with RSTP, VRRP and Port Trunking
- Supports DDMI (Digital Diagnostics Monitoring Interface) SFP

XGS-4728F
10-Gigabit Ethernet switch, managed Layer 3, 24 x dual personality ports, 1 x 2-port 10G open slot, and 2 x 12 Gbit Stacking Port, 19" rackmount

GS-4012F
Gigabit Ethernet switch, managed L3, 8 SFP ports, 4 x dual personality ports, 19" rackmount

Advantages

True Wire-speed L3 Switching for High-Performance Networks
The Metro Switch 4000 Series delivers wire-speed full-dynamic IP routing features, such as OSPF and RIP, using a hardware-based IP routing engine and sophisticated multilayer operating software. In addition to dynamic IP multicast, the Metro 4000 Series supports Distance Vector Multicast Routing Protocol (DVMRP) and Internet Group Management Protocol (IGMP) to perfectly handle a variety of datagrams, making the ZyXEL Metro 4000 Series an ideal solution for today's multi-service network environments.

Advanced QoS for Significant Service

The ZyXEL Metro Switch 4000 Series offers wire-speed flow control that can classify, policy, and prioritize incoming packets according to the predefined QoS policies to meet service provider requirements. In terms of classification, Differentiated Services Code Point field (DSCP) and the 802.1p class of service (CoS) fields are identified to assess the priority of incoming packets.
Classification and reclassification can be based on criteria as specific as rule-based on IP, MAC addresses, VLAN ID and TCP/UDP port number. For bandwidth management, the ZyXEL Metro Switch 4000 Series provides 8 priority queues per port for different types of traffics, allowing service providers to set rule-based rate limiting that takes full advantage of limited network resources and guarantees the best performance.

Specifications

Backplane	144 Gbps, non-blocking (XGS-4728F) 24 Gbps, non-blocking (GS-4012F)
MAC addresses	16,000
VLAN support	256 static, 4,000 dynamic
IP addresses	8,000
Routing entries	8,000
Data transfer and prioritization	802.1p (8 priority queues per port), IP routing, RIP-1/2, OSPF, WFQ/WRR/SPG, jumbo frame, DVMRP, IGMP snooping, MVR, 802.1Q VLAN tagging, GVRP, bandwidth management, iFlow
Redundancy	802.3ad link aggregation, VRRP, 802.1w RSTP, 802.1s MSTP
Security	802.1x RADIUS authentication, SSH, SSL, intrusion lock, MAC filtering/forwarding, MAC freeze, VLAN stacking, TACACS+, RADIUS, iSafe
Extensions	iStacking, management of up to 24 switches via one IP
Management	SNMP v3, RMON, DHCP, RS-232 console, Telnet CLI, web management, port mirroring
Extension modular	10 Gbit CX4 slot module (EM-412) (only for XGS-4728F) 10 Gbit XFP slot module (EM-422) (only for XGS-4728F)
Mounting	19" rackmount, 1U
Power supply	100 - 240 V AC, 50/60 Hz
Dimensions	438 x 310 x 44.5 mm (WxDxH)(XGS-4728F) 438 x 225 x 44.5 mm (WxDxH)(GS-4012F)

Metro Switch 3000 Series

Metro Layer 2 Managed Switch
— Gigabit Ethernet

Gigabit Switch for High-performance Gigabit Backbone Applications

- Non-blocking 24 Gbps switching fabric
- Policy-based Quality of Service (QoS) and IGMP v1/2/3 support
- Intelligent ACL
- Supports DDMI (Digital Diagnostics Monitoring Interface) SFP
- External alarm block (4 inputs, 1 output)
- AC/DC dual-input for flexible power source choice
- Metro Ethernet Forum certified

MGS-3712
Gigabit Ethernet switch, managed L2, 8 RJ45 ports, 4 x dual personality ports, 19" rackmount

MGS-3712F
Gigabit Ethernet switch, managed L2, 8 SFP ports, 4 x dual personality ports, 19" rackmount

Advantages

The ZyXEL MGS-3712 and MGS-3712F L2 Gigabit Ethernet switches offer Layer2 switching capability in a smart enclosure. With non-blocking 24 Gbps switching fabric, the MGS-3712 and MGS-3712F feature 8 GbE copper ports (8 port GbE SFP on MGS-3712F) and 4 dual-personality GbE (GbE SFP +1000Base-T) ports.

The ZyXEL MGS-3712 and MGS-3712F also provide L2/L3/L4 advanced features and a high-performance hardware platform as well as robust security, Quality of Service (QoS) and management features. Combined with new features such as VLAN Stacking and VLAN translation, it has become possible to isolate the customer's traffic from each other and from the core network internal signalling traffic.

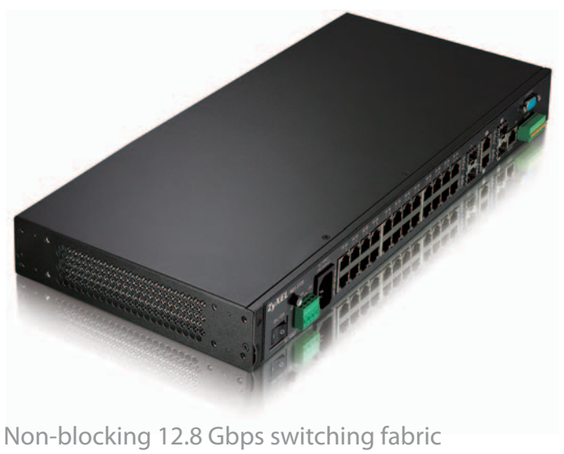
For Metro Ethernet purpose, "Front Access" for easy wiring and maintenance in the outdoor cabinet has been added. The flexible power source includes AC/DC dual input. The external alarm input/output block connects cabinet mechanical parts to the management networks. Extended operation temperature and high humidity protection enable topology extensions to everywhere.

Specifications

Backplane	24 Gbps, non-blocking
MAC addresses	16,000
VLAN support	VLAN, 2,000 static/4,000 dynamic, GVRP support, subnet-based VLAN, selective QinQ
Data transfer and prioritization	802.1p with 8 priority queues per port, SPQ/WRR/WFQ, port-based rate limiting, policy-based rate limiting, port-based traffic shaping, policy-based bandwidth control, port-based regress traffic shaping, policy-based traffic mirroring, IGMP snooping (IGMP v1/v2/v3), TRTCM
Redundancy	802.3ad link aggregation, 802.1w RSTP, 802.1s MSTP, BPS (Backup Power System)
Security	802.1x authentication, intelligent ACL, static MAC filtering, 802.1Q VLAN, SSL, SSH, intrusion lock, MAC freeze
Management	iStacking, CLI over Telnet/SSH/RS232 console, Web GUI over HTTP/HTTPS, SNMP v2c, v3 manageable, RMON, Out-of-band MGMT port, F/w upgrade, configuration backup/restore via ftp, IEEE 802.1ag CFM, IEEE 802.3ah OAM
Extensions	Alarm LED indicator for early warning of hardware troubles, Cisco like Command Line Interface
Mounting	19" rackmount, 1U
Power supply	AC: 100 ~ 240 V 50/60 Hz, 0.6 A max. DC: -36 V to -72 V, 0.85 A max.
Dimensions	438 x 215 x 44.45 mm (WxDxH)

Metro Switch 3000 Series

Metro Layer 2 Managed Switch
— Fast Ethernet



Telco-class Layer 2 Fast Ethernet Switches

- Non-blocking 12.8 Gbps switching fabric
- Policy-based QoS Optimizes Multi-service Quality
- IGMP Snooping v1, v2, v3, MVR
- Supports DDMI (Digital Diagnostics Monitoring Interface) SFP
- Multilayer-aware (L2/L3/L4) ACL for Security Protection
- High Redundancy and Resilient Architecture with RSTP, VRRP & Port Trunking
- Metro Ethernet Forum certified

MES-3728
Fast Ethernet switch, managed L3, 24 ports RJ45, 2 x Gigabit SFP slots, 2 x dual personality ports, 19" rackmount

ES-3124F
Fast Ethernet switch, managed L2, 24 Ports SFP 100 Mbit, 4 x SFP port Gigabit

Advantages

Advanced QoS for Significant Services
Consistent service quality and reliable connecting ability in a converged network is the key for service providers to win customers and build loyalty; therefore the ability to control traffic flow and set traffic policy becomes more critical than ever. The Metro Switch 3000 Series offers wire-speed flow control that classifies and prioritizes the incoming packets according to the predefine QoS policies that meet requirements of service providers.

Resilient and Redundant Design
A quick recovery and round-the-clock network is vital for service providers to establish a robust network. The Metro Switch 3000 Series provides comprehensive features to make sure network is well operated. The IEEE 802.3ad Link Aggregation feature reduces network downtime by providing redundant paths and bandwidth aggregation to critical connections, while IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) and IEEE 802.1s Multiple Spanning Tree Protocol (MSTP) allow immediate recovery from failed connections by sending packets via the backup link. Furthermore, since the Metro Switch 3000 Series supports backup power system, the power is supplied to the switch in case of an unexpected outage.

Specifications

Backplane	12.8 Gbps, non-blocking
MAC addresses	16,000
VLAN support	VLAN, 2,000 static/4,000 dynamic, GVRP support, subnet-based VLAN, selective QinQ
Data transfer and prioritization	802.1p with 8 priority queues per port, SPQ/WRR/WFQ, port-based rate limiting, policy-based rate limiting, port-based traffic shaping, policy-based bandwidth control, port-based regress traffic shaping, policy-based traffic mirroring, IGMP snooping (IGMP v1/v2/v3), TRTCM
Redundancy	802.3ad link aggregation, 802.1w RSTP, 802.1s MSTP, BPS (Backup Power System)
Security	802.1x authentication, intelligent ACL, static MAC filtering, 802.1Q VLAN, SSL, SSH, intrusion lock, MAC freeze
Extensions	iStacking, management of up to 24 switches via one IP
Management	CLI over Telnet/SSH/RS232 console, Web GUI over HTTP/HTTPS, SNMP v2c, v3 manageable, RMON, Out-of-band MGMT port, F/w upgrade, configuration backup/restore via ftp, IEEE 802.1ag CFM, IEEE 802.3ah OAM
Extensions	Alarm LED indicator for early warning of hardware troubles, Cisco like Command Line Interface (MES-3728)
Mounting	19" rackmount, 1U
Power supply	AC: 100-240 V 50/60 Hz, DC: -36 V to -72 V, 0.85 A max. (MES-3728) AC: 100 ~ 240 V 50/60 Hz (ES-3124F)
Dimensions	438 x 215 x 44.45 mm (WxDxH)(MES-3728) 438 x 300 x 44.45 mm (WxDxH)(ES-3124F)

Metro Switch 2000 Series

Metro Layer 2 Managed Switch
— Fast Ethernet

- Feature Rich Ethernet Managed Solution
- 2 Dual Personality GbE Ports (Fiber Port Support Both GbE/FE SFP)
- Small Format Desktop Design
- Rack Mount Option
- Port Security
- 802.1X Guest VLAN
- Network Storm Protection
- 802.1X Port-Based/MAC-Based Access Control
- IP-MAC-Port Binding Access Control
- Supports DDMI (Digital Diagnostics Monitoring Interface) SFP

MES-2110
Fast Ethernet switch, 8 ports RJ45, 2 x dual personality ports

Advantages

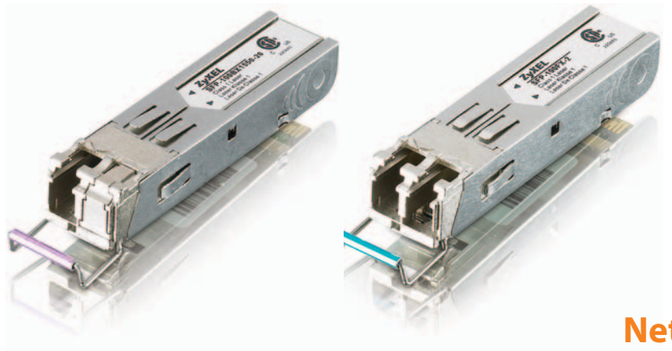
Advanced Features Protect the Investment in Triple-play Services
The ZyXEL MES-2110 Switch is positioned to deliver wire-speed high performance critical in the network. Designed to IEEE specifications the ZyXEL MES-2110 leverages your existing investment in multi-service environments. Within the network QoS is critical, the MES-2110 conforms to the IEEE 802.3p/Q standard which ensures that time critical applications are handled with the required quality. The MES 2110 Switch can prioritise applications using WFQ (Weighted Fair Queuing) scheduling algorithm to allocate more bandwidth to key traffic such as VoIP Voice and IPTV transmission. The solution enables the business to take full advantage of limited network resources and to guarantee the best performance. These features enable the Metro Switch MES-2110 to support triple-play services easily.

Specifications

MAC addresses	8,000
VLAN support	4,000 static
Data transfer and prioritization	802.1p (4 priority queues per port), WFR/ SPQ, IGMP snooping, 802.1Q VLAN tagging, GVRP, broadcast storm control, bandwidth management, IGMP snooping (IGMP v1/v2), MVR
Redundancy	802.3ad link aggregation, 802.1w RSTP
Security	Port security, guest VLAN, IP/MAC/port binding
Management	SNMP V1/v2c, RMON, RS-232 console, Telnet CLI, web management, port mirroring
Extensions	Alarm LED indicator for early warning of hardware troubles, Cisco like Command Line Interface
Mounting	Desktop device, brackets for 19" rackmount
Power supply	AC: 100 ~ 240 V 50/60 Hz
Dimensions	268 x 128 x 44 mm (WxDxH)

SFPs

Fibre Transceivers



Network Access via Active Fibre

- Industry Standard Compliance
- SFP MSA (Multi-Source Agreement) Compliance
- Hot-Pluggable with Maximum Flexibility
- Compact Size, High Port Density
- Low Power Dissipation

Advantages

Standard-based Design Assures Compatibility
The ZyXEL transceiver family follows industry standards to assure compatibility with switches from other manufacturers without barrier set by proprietary technologies.

Comprehensive Portfolio for Different Connectivity Demands
With ZyXEL's comprehensive Fast, Gigabit and 10 G transceiver product range, users can just plug the proper model onto the network to extend the physical coverage.

Swappable Design Facilitates Network Maintenance
Independent transceiver design provides the highest network maintenance flexibility. Transceivers can be freely added when required, and infrastructure upgrades or transceiver repairs can be done easily by just replacing the transceiver instead of the whole device.

Supporting DDMI (Digital Diagnostics Monitoring Interface) SFP Enhances Management Capability
The digital diagnostic monitoring interface enables users to have the capability of performing component monitoring, fault isolation and failure prediction tasks on their transceiver-based links. This feature ensures that the business can be proactive in preventative maintenance of the network and ensure business continuity.

DDMI Monitors:
- Temperature
- Supply voltage
- Transmitted bias current
- Transmitted power
- Received power

All features listed above include alarm and warning thresholds.

Specifications

Transceiver Class	10 Gigabit XFP			Gigabit SFP							Fast Ethernet SFP				
	FTLX8511D3 (XFP-SR)	FTLX1611M3 (XFS-ER)	FTLX1412D3BCL (XFP-LR)	SFP-1000T	SFP-SX-D	SFP-LX-10-D	SFP-BX1310-10-D	SFP-BX1490-10-D	SFP-LHX1310-40-D	SFP-ZX-80-D	SFP-100FX-2	SFP-100TX	SFP-100LX-20	SFP-100BX1310-20-D	SFP-100BX1550-20-D
Connector	LC	LC	LC	RJ-45	LC	LC	LC	LC	LC	LC	LC	RJ-45	LC	LC	LC
Wavelength	850 nm	1550 nm	1310 nm	-	850 nm	1310 nm	1310 nm (TX) 1490 nm (RX)	1490 nm (TX) 1310 nm (RX)	1310 nm	1550 nm	1550 nm	-	1310 nm	1310 nm (TX) 1550 nm (RX)	1550 nm (TX) 1310 nm (RX)
Max Transmission Distance	300 m	40 km	10 km	100 m	550 m	10 km	10 km	10 km	40 km	80 km	2 km	-	20 km	20 km	20 km
Support DDMI Features	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes	Yes	-	-	-	Yes	Yes

Model Name	Optical Line Terminal	MDU/ONU
	OLT-1308S-22	ONU-2024-21
System Overview		
Dimensions W × D × H (mm)	440 x 312 x 44	440 x 173 x 44
Housing Type	Mini Chassis	Pizza Box
Power Consumption	<90 W	<25 W
Power	100 ~ 240 V AC -48 V DC	100 ~ 240 V AC
Operating Temperature	0 ~ 50°C	0 ~ 45°C
Operating Humidity	5% ~ 90% RH	10% ~ 90% RH
Interface		
Uplink Interface		
1000Base-T	2	1
1000Base-SX/LX	4	1
LAN Interface	-	24 x 10/100Based-T
PON Interface (20 km)	8	1
Maintenance Interface		
10/100Base-T	1	-
DB9 Serial Port	1	1
QoS Function		
802.1p Priority Queue	8 queues	4 queues
802.1q Tag-based VLAN	Yes	Yes
802.3x Flow Control	Yes	Yes
Management		
SNMP v1, v2c	Yes	Yes
MIBs II	Yes	Yes
Web-based GUI	Yes	Yes
Telnet CLI	Yes	Yes
OAM Loop Back	Yes	Yes
Failure Alarm Detecting Function (Power/Linkdown/UNI Port Status)	Yes	Yes
Security Function		
802.1x Authentication	Yes	Yes
Encryption (AES-128)	Yes	Yes
VLAN Stacking	Yes	-
MAC Filtering	Yes	Yes
MAC Counting	Yes	Yes
MAC Address Table	16k	8k

Model Name	Optical Network Unit			
	ONU-6100B-21/22	ONU-6040BF-22	ONU-6040B-21/22	ONU5100-B22
System Overview				
Standard Compliance	IEEE 802.3ah	IEEE 802.3ah	IEEE 802.3ah	IEEE 802.3ah
Dimensions W × D × H (mm)	181 x 123 x 36	188 x 120 x 30	188 x 120 x 30	68 x 14 x 12
Fiber Storage	-	Yes	-	-
Housing Type	Wall-mounting	Wall-mounting	Wall-mounting	-
Power	12 V/1.5 A	12 V/1 A	12 V/1.5 A	-
Power Consumption	<10 W	<12 W	<10 W	-
Operating Temperature	0°C ~ 45°C	0°C ~ 45°C	0°C ~ 45°C	0°C ~ 70°C
Operating Humidity	5% ~ 95% RH	Less than 90% RH	5% ~ 95%	10% ~ 80%
Interface				
PON Interface (10 km or 20 km)	1000Based-PX10 or 1000Based-PX20	1000Based-PX-20U	1000Based-PX10 or 1000Based-PX20U	1000Based-PX-20U
Maintenance Interface (10/100Based-T)	-	-	-	-
RF Overlay	-	1	-	-
LAN Interface	1 x 10/100/1000Based-T	4 x 10/100Base-T	4 x 10/100Base-T	-
QoS Function				
802.1p Priority Queue	4 queues	4 queues	4 queues	4 queues
802.1q Tag-based VLAN	Yes	Yes	Yes	Yes
802.3x Flow Control	Yes	Yes	Yes	Yes
Management				
SNMP v1, v2c	Managed by OLT	Managed by OLT	Managed by OLT	Managed by OLT
MIBs II	Managed by OLT	Managed by OLT	Managed by OLT	Managed by OLT
Telnet CLI	-	-	-	-
OAM Loop Back	Yes	Yes	Yes	Yes
Failure Alarm Detecting Function (Power/Linkdown/UNI Port Status)	Yes	Yes	Yes	-
Security Function				
802.1x Authentication	Yes	Yes	Yes	Yes
Encryption (AES-128)	Yes	Yes	Yes	Yes
MAC Filtering	Yes	Yes	Yes	Yes
MAC Counting	Yes	Yes	Yes	Yes
MAC Address Table	64	64	64	64

Model Name	P-3202HN-Ba	P-3202H-Bb
Description	Draft 802.11N GPON RG	GPON VoIP IAD
WAN Interface	GPON Interface with Single Mode Fiber	GPON Interface with Single Mode Fiber
Ethernet Port (10/100/1000)	4	4
POTS FXS Port	2	2
PSTN Lifeline Port	-	-
DECT	-	-
USB Port	-	-
Voice Features		
SIP v2 (RFC 3261)	Yes	Yes
SDP (RFC 2327)	Yes	Yes
RTP (RFC 3550)	Yes	Yes
RTCP (RFC 3550)	Yes	Yes
G.168 Echo Cancellation	Yes	Yes
VAD/CNG	Yes	-
CODEC	G.711, G.729a/b	G.711, G.729a/b
DTMF Detection	Yes	Yes
DTMF: In-Band and Out-of-Band (RFC 2833), (SIP INFO)	Yes	In-Band only
QoS (IP Bandwidth Management)	Yes	-
ToS Support	Yes	-
Phonebook	Yes	Yes
FAX, Modem Detection and Pass-through	Yes	-
T.38 FAX	Yes	-
IVR	-	-
Early Media	-	-
Call Waiting	Yes	Yes
Call Hold	Yes	Yes
Call Transferring	Yes	Yes
Call Forwarding	Yes	Yes
Do Not Disturb	Yes	Yes
Three Way Conference	Yes	-
Flexible Dial Plan	Yes	Yes
GPON Compliance		
ITU-T G.984.1	Yes	Yes
ITU-T G.984.2	Yes	Yes
ITU-T G.984.3	Yes	Yes
ITU-T G.984.4	Yes	Yes
Wireless Feature		
WLAN	Draft IEEE 802.11N	-
Firewall		
Stateful Packet Inspection	Yes	-
Denial of Service	Yes	-
Network		
TCP/IP	Yes	Yes
PPPoE	Yes	Yes
DHCP Client	Yes	Yes
DHCP Server	Yes	-
UPnP	Yes	-
IP Policy Routing	Yes	-
Multi-to-Multi NAT	Yes	-
Dynamic DNS (DDNS)	Yes	-
IGMP	Yes	Yes
Management		
Web Configurator	Yes	Yes
TR-069/TR-104	Yes	Yes
OMCI	Yes	Yes
Remote Firmware Upgrade	Yes	Yes

Model Name	FSG2200	FSG2100	FSG1100
Description	802.11n Active Fiber GE IAD	802.11n Active Fiber IAD	802.11n Active Fiber Gateway
WAN Interface	1000/100Base-BX (SC/APC)	100Base-BX (SC/APC)	100Base-LX (SC/LC/SFP)
Ethernet Port (10/100)	-	4	4
Ethernet Port (10/100/1000)	4	-	-
POTS FXS Port	2	2	-
PSTN Lifeline Port	-	-	-
DECT	-	-	-
USB Port	2	1	-
Voice Features			
SIP v2 (RFC 3261)	Yes	Yes	-
SDP (RFC 2327)	Yes	Yes	-
RTP (RFC 3550)	Yes	Yes	-
RTCP (RFC 3550)	Yes	Yes	-
G.168 Echo Cancellation	Yes	Yes	-
VAD/CNG	Yes	Yes	-
CODEC	G.711, G.729a/b, G.723 (Option), G.726 (Option)	G.711, G.729a/b, G.723 (Option), G.726 (Option)	-
DTMF Detection	Yes	Yes	-
DTMF: In-Band and Out-of-Band (RFC 2833), (SIP INFO)	Yes	Yes	-
QoS (IP Bandwidth Management)	Yes	Yes	-
ToS Support	Yes	Yes	-
Phonebook	Yes	Yes	-
FAX, Modem Detection and Pass-through	Yes	Yes	-
T.38 FAX	Yes	Yes	-
IVR	-	-	-
Early Media	-	-	-
Call Waiting	Yes	Yes	-
Call Hold	Yes	Yes	-
Call Transferring	Yes	Yes	-
Call Forwarding	Yes	Yes	-
Do Not Disturb	Yes	Yes	-
Three Way Conference	Yes	Yes	-
Flexible Dial Plan	Yes	Yes	-
Wireless Feature			
WLAN	IEEE 802.11n (2x2)	IEEE 802.11n (2x2)	IEEE 802.11n (1x1)
Firewall			
Stateful Packet Inspection	Yes	Yes	Yes
Denial of Service	Yes	Yes	Yes
Network			
TCP/IP	Yes	Yes	Yes
PPPoE	Yes	Yes	Yes
DHCP Client	Yes	Yes	Yes
PPPoA	Yes	Yes	Yes
DHCP Server	Yes	Yes	Yes
UPnP	Yes	Yes	Yes
IP Policy Routing	Yes	Yes	Yes
Multi-to-Multi NAT	Yes	Yes	Yes
Dynamic DNS (DDNS)	Yes	Yes	Yes
IGMP	Yes	Yes	Yes
Management			
Web Configurator	Yes	Yes	Yes
TR-069/TR-104	Yes	Yes	TR-069
Remote Firmware Upgrade	Yes	Yes	Yes
SNMP	-	-	Yes

Fiber Access
Feature Matrix

Model Name	XGS-4728F	GS-4012F
Switch Class	Layer 3+	Layer 3+
Hardware		
1 Gigabit RJ45 Ports	-	-
1 Gigabit SFP Slots	-	8
Dual personality Gigabit Ports (RJ45/SFP)	24	4
12 Gigabit CX4 Ports	2	-
10 Gigabit XFP Slots	1	-
Ports with PoE 802.3af (can be used simultaneously)	-	-
Wire-speed	Yes	Yes
Backplane Bandwidth (Gbps)	144	24
Forwarding Rate (Mbps)	107	17.8
MAC Addresses	16000	16000
Management		
Manage (CLI, Web, GUI)	Yes	Yes
iStacking (Single IP Management)	Yes	Yes
Out-of-band Management Port	Yes	Yes
Routing/Redundancy		
OSPF	Yes	Yes
RIP v1, v2	Yes	Yes
Static IP Routing	Yes	Yes
VRRP	Yes	Yes
Spanning Tree (STP/MSTP/RSTP)	Yes/Yes/Yes	Yes/Yes/Yes
Backup Power Support	Yes	Yes
Quality of Service		
Priority Queues	8	8
Data Prioritisation (SPQ/WRR/WFQ)	Yes/Yes/Yes	Yes/Yes/-
ACL Data Prioritization (L2/L3/L4)	Yes	Yes
IGMP Snooping (v1/v2/v3)	Yes	Yes
MVR	Yes	Yes
Jumbo Frame Forwarding	Yes	Yes
DVMRP	Yes	Yes
802.1p Class of Aervice	Yes	Yes
Security		
MAC Freeze/Intrusion Lock	Yes	Yes
802.1x Authentication	Yes	Yes
TACACS+	Yes	Yes
ACL Security Filter L2/L3/L4	Yes	Yes
RADIUS MAC Login	Yes	Yes
VLAN Stacking (Q-in-Q)	Yes	Yes

Model Name	MGS-3712	MGS-3712F	MES-3728	ES-3124F	MES-2110
Switch	Cabinet Switch Solution	Cabinet Switch Solution	Cabinet Switch Solution	Metro Access Layer	Metro Access Layer
Port Density					
10/100Base-TX, RJ-45 Ports	-	-	24	-	8
Open SFP Slot (FE)	-	-	-	24	-
1000Base-T, RJ-45 Ports	8	-	-	-	-
GbE Open SFP Slot	-	8	2	2	-
Dual Personality GbE Ports	4	4	2	2	2
10G Extend Slot	-	-	-	-	-
12G Stacking Port	-	-	-	-	-
Performance					
Switching Capacity	24 Gbps	24 Gbps	12.8 Gbps	12.8 Gbps	5.6 Gbps
Switching Forwarding Rate	17.8 Mpps	17.8 Mpps	9.6 Mpps	9.6 Mpps	1.2 Mpps
Packet Buffer	1 MB (on chip)	1 MB (on chip)	1 MB (on chip)	32 MB (external)	128 KB (on chip)
MAC Address	16 K	16 K	16 K	16 K	8 K
Reliance and Availability					
All Series Support	• STP/RSTP/MSTP • IEEE 802.3ad LACP (max # Trunks/Links per Trunk): 6/8 • Dual Configuration Files • Loop Guard • MRSTP • Redundant Power Supply Support				
Traffic Control					
All Series Support	• 802.1Q Port Base VLAN • VLAN Trunking • GVRP • IP Subnet-Based VLAN • BPDU Transparency				
Security					
All Series Support	• 802.1x • Port Security • MAC Authentication • MAC Filtering • SSHv1v2 • SSL • Intrusion Lock • MAC Freeze • ACL (L2/L3/L4) security filtering • Port Isolation • IP Source Guard				
Quality of Service (QoS)					
All Series Support	• 802.1p Priority Queues per Port:8 • Broadcast Storm Control • Rate Limiting, policy based • Traffic Shaping, port based • ACL (L2/L3/L4) Prioritization • 802.1p Class of Service • DiffServ (DSCP) • Two Rate Three Color Marking				
Management					
802.3ag CFM	Yes	Yes	Yes	-	-
All Series Support	• iStacking • Web Interface • CLI • DHCP Relay per VLAN • DHCP Client (Management) • DHCP Option 82 • NTP • Daylight Saving • Port Mirroring • RJ-45 Out-of-band Management Port • RS-232 Out-of-band Console Port • TACACS+ Authentication • TACACS+ • RADIUS Accounting • SNMP v1, v2c, v3 • SNMP Trap Group • RMON (1, 2, 3, 9) • Syslog • Jumbo Frame Support on Gigabit Ports • 802.3ah OAM (Link Discovery, Loopback)				
Environmental Specification					
Operating Temperature	0°C ~ 65°C	0°C ~ 65°C	0°C ~ 65°C	0°C ~ 45°C	0°C ~ 50°C
Storage Temperature	-25°C ~ 70°C	-25°C ~ 70°C	-25°C ~ 70°C	-25°C ~ 70°C	-25°C ~ 70°C
Operating Humidity	10% ~ 99% (non-condensing)	10% ~ 99% (non-condensing)	10% ~ 99% (non-condensing)	10% ~ 90% (non-condensing)	10% ~ 90% (non-condensing)
Physical Feature					
Power Supply	AC, DC Dual Power Supply AC Power: 100 to 240 V, 50/60 Hz DC Power: -48 to -60 V DC		AC Power: 100 to 240 V, 50/60 Hz DC Power: -48 to -60 V DC		AC Power: 110 to 240 V, 50 ~ 60 Hz DC Power: -36 to -72 V
Dimensions W x D x H (mm)	438 x 310 x 44.45	438 x 225 x 44.45	438 x 215 x 44.45	438 x 173 x 44.45	438 x 270 x 44.45

Fiber Access
Feature Matrix

		Metro 4000 series		Metro 3000 series				Metro 2000 series
		XGS-4728F	GS-4012F	MGS-3712	MGS-3712F	MES-3728	ES-3124F	MES-2110
10 Gigabit XFP Transceivers	FTLX8511D3 (XFP-SR)	Yes	-	-	-	-	-	-
	FTLX1611M3 (XFS-ER)	Yes	-	-	-	-	-	-
	FTLX1412D3BCL (XFP-LR)	Yes	-	-	-	-	-	-
Gigabit SFP Transceivers	SFP-1000T	Yes	Yes	Yes	Yes	GbE Slot	GbE Slot	Yes
	SFP-SX-D	Yes	Yes	Yes	Yes	GbE Slot	GbE Slot	Yes
	SFP-LX-10-D	Yes	Yes	Yes	Yes	GbE Slot	GbE Slot	Yes
	SFP-BX1310-10-D	Yes	Yes	Yes	Yes	GbE Slot	GbE Slot	Yes
	SFP-BX1490-10-D	Yes	Yes	Yes	Yes	GbE Slot	GbE Slot	Yes
	SFP-LHX1310-40-D	Yes	Yes	Yes	Yes	GbE Slot	GbE Slot	Yes
	SFP-ZX-80-D	Yes	Yes	Yes	Yes	GbE Slot	GbE Slot	Yes
Fast Ethernet SFP Transceivers	SFP-100FX-2	-	-	-	-	-	Yes	Yes
	SFP-100TX	-	-	-	-	-	Yes	Yes
	SFP-100LX-2	-	-	-	-	-	Yes	Yes
	SFP-100BX1310-20-D	-	-	-	-	-	Yes	Yes
	SFP-100BX1550-20-D	-	-	-	-	-	Yes	Yes

DSL CPE

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P-870HN

802.11n Wireless VDSL2 4-port Gateway

P-870HN
WLAN broadband router/access point with VDSL2 modem, 802.11n, 4 port switch, SPI firewall

VDSL2 Gateway for Triple Play Services

- VDSL2/ADSL2+ dual-mode support
- 802.11n AP functions built-in (2x2)
- Superior QoS and Traffic Management
- SPI firewall Protection
- Remote provisioning, management through TR-069

Specifications

WAN connection	VDSL2/ADSL2+ Dual Mode (up to 17a profile)
Bridge/Router functionality	Bridge/Router, NAT, DHCP Client/Server/Relay, RIP I/II, IGMP v1/v2/v3
QoS/VLAN	ATM QoS, 802.1p/q, IP QoS
Wireless	IEEE 802.11n compliant, Data Rate: 300 Mbps, Frequency Range: 2.4 GHz
Security & Firewall	SPI Firewall, Content Filtering
Management	Via Web/Telnet/FTP/TFTP/SNMP, TR-069
Green	EuP, CoC, WEEE & RoHS
Others	UPnP
Dimensions	231 x 147 x 57 mm (WxDxH)

P-870H/P-870HW

802.11g Wireless VDSL2 4-port Gateway

P-870H
Broadband router with VDSL2 modem, 4 port switch, SPI firewall

P-870HW
WLAN broadband router/access point with VDSL2 modem, 802.11g, 4 port switch, SPI firewall

VDSL2 Gateway for Triple Play Services

- ITU-T G.993.2 VDSL2 standard compliance
- 802.11g AP function built-in (HW series only)
- Superior QoS and Traffic Management
- Remote provisioning, management through TR-069

Specifications

WAN connection	VDSL2 (up to 17a profile)
Bridge/Router functionality	Bridge/Router, NAT, DHCP Client/Server/Relay, RIP I/II, IGMP v1/v2/v3
QoS/VLAN	ATM QoS, 802.1p/q, IP QoS
Wireless	IEEE 802.11g compliant, Data Rate: 54 Mbps, Frequency Range: 2.4 GHz (P-870HW)
Security & Firewall	SPI Firewall, Content Filtering
Management	Via Web/Telnet/FTP/TFTP/SNMP, TR-069
Green	EuP, CoC, WEEE & RoHS
Others	UPnP
Dimensions	189 x 132 x 40 mm (WxDxH)

P-871M

VDSL Modem

P-871M
VDSL Modem

Point-to-point VDSL Modem

- Greater point to point bandwidth capacity base on VDSL technology
- Selectable CO/CPE configuration through dedicate hardware switch
- Plug and play design

Specifications

WAN connection	VDSL 80M/40Mbps
Bridge/Router functionality	Bridge Mode
Management	F/W upgrade, and CLI command via console
Green	EuP, WEEE & RoHS
Others	Point to Point application
Dimensions	189 x 132 x 40 mm (WxDxH)

P-870M v2

VDSL2 Modem

P-870M v2
VDSL2 Modem

VDSL2 Modem for Triple Play Services

- Ultra high speed connectivity through VDSL2
- Superior QoS for traffic management
- Plug and play design

Specifications

WAN connection	VDSL2 17a support (optional HW for 30a)
Bridge/Router functionality	Bridge mode
QoS/VLAN	IEEE 802.p
Management	F/W upgrade, and CLI command via console
Green	EuP, WEEE & RoHS
Dimensions	189 x 132 x 40 mm (WxDxH)

802.11n Wireless VDSL2 VoIP IAD for Residential

- VDSL2/ADSL2+ dual mode support
- Dedicate Gigabit Ethernet WAN
- 802.11n AP functions built-in (2x2)
- SIP with 2 FXS port support
- Full FXO for L model only
- 2 USB host interface
- Superior QoS and traffic management
- Remote provisioning and manage through TR-069/098/104

802.11g Wireless VDSL VoIP IAD for Residential

- VDSL2 high-speed Internet access
- 802.11g AP functions built-in
- SIP with 2 FXS port support
- Full FXO for L model only
- Superior QoS and traffic management
- Remote provisioning and manage through TR-069/104

P-2812HNU

802.11n Wireless VDSL2 Combo WAN IAD

P-2812HNU
VDSL2/ADSL2+/GE ETH VoIP IAD, 802.11n, 4 port G/E Switch, SPI firewall, IPSec VPN, SIP, 2 FXS ports, 2 USB host, Full FXO

Specifications

WAN connection	VDSL2/ADSL2+ Dual Mode
Bridge/Router functionality	RIP I/II, IP Policy Routing, IGMP v1/v2/v3, DHCP Client/Server/Relay, NAT
VoIP	2 FXS port, G.711/G.726/G.729ab* (Option for -51C)/G.722, Full FXO
QoS/VLAN	IP QoS, IEEE 802.1p/1q, ATM QoS
Wireless	IEEE 802.11n compliant, Data Rate: 300 Mbps Frequency Range: 2.4 GHz
Security & Firewall	SPI Firewall, Content Filtering*, IPSec VPN*
USB	3G WAN Backup*, File Sharing, Print server
Management	Via Web/Telnet/FTP/SNMP/ICMP, TR-069/098/104
Green	EuP, CoC, WEEE & RoHS, Wi-Fi Scheduling
Others	UPnP
Dimensions	165 x 65 x 242 mm (WxDxH)

** Firmware upgradeable for future enhancement.*

P-2802HW

802.11g Wireless VDSL2 IAD

P-2802HW
VDSL2 VoIP IAD, 802.11g, 4 port F/E Switch, SPI firewall, IPSec VPN, SIP, 2 FXS ports, Full FXO

Specifications

WAN connection	VDSL2 (up to 30a profile)
Bridge/Router functionality	RIP I/II, IP Policy Routing, IGMP v1/v2, DHCP Client/Server/Relay, NAT
VoIP	2 FXS port, G.711/G.729ab, Full FXO
QoS/VLAN	IP QoS, IEEE 802.1p/1q
Wireless	IEEE 802.11g compliant, Data Rate: 54 Mbps, Frequency Range: 2.4 GHz
Security & Firewall	SPI Firewall, Content Filtering, IPSec VPN
Management	Via Web/Telnet/FTP/SNMP/ICMP, TR-069/104
Green	EuP, WEEE & RoHS
Others	UPnP
Dimensions	165 x 65 x 242 mm (WxDxH)

802.11n Wireless ADSL2+ Security Gateway for SOHO

- ADSL2+ high-speed Internet access
- 802.11n AP function built-in (2x2)
- 2 USB host interface
- Advance Security with SPI firewall and VPN support
- Remote provisioning, management through TR-069

802.11n Wireless ADSL2+ Gateway for Residential

- 802.11n AP function built-in (1x1 or 2x2)
- Standard based WPS for easy and secure WLAN establishment
- Robust SPI firewall protection
- Effective bandwidth management for 3-play applications
- Remote provisioning, management through TR-069

P-661HNU

802.11n Wireless ADSL2+ 4-port Security Gateway

P-661HNU
WLAN broadband router/access point with ADSL2/2+ modem, 802.11n, 4 port switch, SPI firewall, IPSec VPN, 2 USB host

Specifications

WAN connection	ADSL2+
Bridge/Router functionality	Bridge/Router, NAT, DHCP Client/Server/Relay, RIP I/II, IGMP v1/v2/v3
QoS/VLAN	ATM QoS, 802.1p/q, IP QoS
Wireless	IEEE 802.11n compliant, Data Rate: 300 Mbps, Frequency Range: 2.4 GHz
Security & Firewall	2 IPSec VPN tunnels, SPI Firewall, Content Filtering
Management	Via Web/Telnet/FTP/TFTP/SNMP, TR-069
USB	3G Backup, File Sharing
Green	EuP, CoC, WEEE & RoHS, Wi-Fi Scheduling
Others	UPnP
Dimensions	190 x 135 x 40 mm (WxDxH)

P-660HN

802.11n Wireless ADSL2+ 4-port Gateway

P-660HN
WLAN broadband router/access point with ADSL2/2+ modem, 802.11n, 4 port switch, SPI firewall

Specifications

WAN connection	ADSL2+
Bridge/Router functionality	Bridge/Router, NAT, DHCP Client/Server/Relay, RIP I/II, IGMP v1/v2
QoS/VLAN	ATM QoS, 802.1p/q, IP QoS
Wireless	IEEE 802.11n compliant, Data Rate: 300 Mbps (2x2), or 150 Mbps (1x1), Frequency Range: 2.4 GHz
Security & Firewall	SPI Firewall, Content Filtering
Management	Via Web/Telnet/FTP/TFTP/SNMP, TR-069
Green	EuP, CoC, WEEE & RoHS, Wi-Fi Scheduling
Others	UPnP
Dimensions	189 x 132 x 42 mm (WxDxH)

P-662H/P-662HW

802.11g Wireless ADSL2+ 4-port Security Gateway

P-662H
Broadband router with ADSL2/2+ modem, 4 port switch, SPI firewall, IPSec VPN

P-662HW
WLAN broadband router/access point with ADSL2/2+ modem, 802.11g, 4 port switch, SPI firewall, IPSec VPN

ADSL2+ Security Gateway for SOHO

- ADSL2+ high-speed Internet access
- 802.11g AP function built-in (P-662HW Series)
- Advance Security with SPI firewall and VPN support
- Up to 20 VPN connections for remote sites
- Auto failover and fallback WAN backup solution

Specifications

WAN connection	ADSL2+
Bridge/Router	Bridge/Router, NAT, DHCP Client/Server/Relay,
Functionality	RIP I/II, IGMP v1/v2
QoS/VLAN	MBM, ATM QoS
Wireless	IEEE 802.11g compliant, Data Rate: 54 Mbps, Frequency Range: 2.4 GHz (P-662HW)
Security & Firewall	20 IPSec VPN tunnels, SPI Firewall, Content Filtering
Management	Via Web/Telnet/FTP/TFTP/SNMP
Green	EuP, WEEE & RoHS
Others	UPnP
Dimensions	181 x 128 x 36 mm (WxDxH)

P-661H/P-661HW

802.11g Wireless ADSL2+ 4-port Security Gateway

P-661H
Broadband router with ADSL2/2+ modem, 4 port switch, SPI firewall, IPSec VPN

P-661HW
WLAN broadband router/access point with ADSL2/2+ modem, 802.11g, 4 port switch, SPI firewall, IPSec VPN

ADSL2+ Security Gateway for SOHO

- ADSL2+ high-speed Internet access
- 802.11g AP function built-in (P-661HW Series)
- Advance Security with SPI firewall and VPN support

Specifications

WAN connection	ADSL2+
Bridge/Router	Bridge/Router, NAT, DHCP Client/Server/Relay,
Functionality	RIP I/II, IGMP v1/v2
QoS/VLAN	MBM, ATM QoS
Wireless	IEEE 802.11g compliant, Data Rate: 54 Mbps, Frequency Range: 2.4 GHz (P-661HW)
Security & Firewall	2 IPSec VPN tunnels, SPI Firewall, Content Filtering
Management	Via Web/Telnet/FTP/TFTP/SNMP
Green	EuP, WEEE & RoHS
Others	UPnP
Dimensions	178 x 125 x 36 mm (WxDxH)

P-660H/P-660HW

802.11g Wireless ADSL2+ 4-port Gateway

P-660H
Broadband router with ADSL2/2+ modem, 4 port switch, SPI firewall

P-660HW
WLAN broadband router/access point with ADSL2/2+ modem, 802.11g, 4 port switch, SPI firewall

802.11g Wireless ADSL2+ Gateway for Residential

- ADSL2+ high-speed Internet access
- 802.11g AP function built-in (P-660HW Series)
- Robust SPI firewall protection
- Effective bandwidth management for 3-play applications
- Remote provisioning, management through TR-069

Specifications

WAN connection	ADSL2+
Bridge/Router functionality	Bridge/Router, NAT, DHCP Client/Server/Relay, RIP I/II, IGMP v1/v2
QoS/VLAN	MBM, ATM QoS
Wireless	IEEE 802.11g compliant, Data Rate: 54 Mbps, Frequency Range: 2.4 GHz (P-660HW)
Security & Firewall	SPI Firewall, Content Filtering
Management	Via Web/Telnet/FTP/TFTP/SNMP, TR-069
Green	EuP, WEEE & RoHS
Others	UPnP
Dimensions	181 x 128 x 37 mm (WxDxH)

P-660R/P-660RU

ADSL2+ Ethernet/USB Router

P-660R
ADSL 2+ modem/router

P-660RU
ADSL 2+ modem/router with 1 USB connection

ADSL2+ 1-port/Combo Router

- ADSL2+ high-speed Internet access
- Dual-mode USB/Ethernet network interface connection (P-660RU Series)
- Remote provisioning, management through TR-069

Specifications

WAN connection	ADSL2+
Bridge/Router functionality	RIP I/II, IP Policy Routing, IGMP v1/v2, DHCP Client/Server/Relay, NAT
QoS/VLAN	ATM QoS
Management	Via Web/Telnet/FTP/TFTP/SNMP, TR-069
USB	Slave mode, for LAN connection (P-660RU)
Green	EuP, WEEE & RoHS
Others	UPnP
Dimensions	110 x 107 x 36 mm (WxDxH)

ADSL2+ Bonded Gateway

- Greater bandwidth supplied by ADSL2+ bonding
- ITU G.998.1 Standard based Multi-Pair Bonding
- Standard based WPS for easy and secure WLAN establishment
- Remote provisioning, management through TR-069

P-663H

ADSL2+ 4-port Gateway with Port Bonding

P-663H
Broadband router with ADSL2/2+ modem, 4 port switch,
SPI firewall with port bonding

Specifications

WAN connection	ADSL2+ Bonding (4-wire)
Bridge/Router functionality	RIP I/II, IP Policy Routing, IGMP v1/v2, DHCP Client/Server/Relay, NAT
QoS/VLAN	ATM QoS, 802.1p/q, IP QoS
Security & Firewall	SPI Firewall, Content Filtering
Management	Via Web/Telnet/FTP/TFTP/SNMP, TR-069
Green	EuP, CoC, WEEE & RoHS
Others	UPnP
Dimensions	207 x 161 x 52 mm (WxDxH)

802.11n Wireless ADSL2+ Bonded Gateway

- Greater bandwidth supplied by ADSL2+ bonding
- ITU G.998.1 Standard based Multi-Pair Bonding
- 802.11n wireless AP function built-in
- Standard based WPS for easy and secure WLAN establishment
- Remote provisioning, management through TR-069

P-663HN

802.11n Wireless ADSL2+ 4-port Gateway with Port Bonding

P-663HN
WLAN broadband router/access point with ADSL2/2+ modem,
802.11n, 4 port switch, SPI firewall with port bonding

Specifications

WAN connection	ADSL2+ Bonding (4-wire)
Bridge/Router functionality	RIP I/II, IP Policy Routing, IGMP v1/v2, DHCP Client/Server/Relay, NAT
QoS/VLAN	ATM QoS, 802.1p/q, IP QoS
Wireless	IEEE 802.11n compliant, Data Rate: 300 Mbps, Frequency Range: 2.4 GHz
Security & Firewall	SPI Firewall, Content Filtering
Management	Via Web/Telnet/FTP/TFTP/SNMP, TR-069
Green	EuP, CoC, WEEE & RoHS
Others	UPnP
Dimensions	241 x 165 x 63 mm (WxDxH)

802.11n Wireless ADSL2+ VoIP IAD for Residential

- ADSL2+ high-speed Internet access
- Dedicate Gigabit Ethernet WAN
- 802.11n AP functions built-in (2x2)
- SIP with 2 FXS port support
- 2 USB host interface
- Superior QoS and traffic management
- Remote provisioning and manage through TR-069/098/104

P-2612HNU

802.11n Wireless ADSL2+ VoIP Combo WAN IAD

P-2612HNU
ADSL2+/GE ETH VoIP IAD, 802.11n, 4 port G/E Switch,
SPI firewall, IPSec VPN, SIP, 2 FXS ports, 2 USB host

Specifications

WAN connection	ADSL2+, 10/100/1000 Mbps ETH
Bridge/Router functionality	RIP I/II, IP Policy Routing, IGMP v1/v2/v3, DHCP Client/Server/Relay, NAT
VoIP	2 FXS port, G.711/G.726/G.729ab/G.722
QoS/VLAN	IP QoS, IEEE 802.1p/1q, ATM QoS
Wireless	IEEE 802.11n compliant, Data Rate: 300 Mbps, Frequency Range: 2.4 GHz
Security & Firewall	SPI Firewall, Content Filtering*, IPSec VPN*
Management	Via Web/Telnet/FTP/SNMP/ICMP, TR-069/098/104
USB	3G Backup*, File Sharing, Print server
Green	EuP, CoC, WEEE & RoHS, Wi-Fi Scheduling
Others	UPnP
Dimensions	265 x 145 x 42 mm (WxDxH)

** Firmware upgradeable for future enhancement.*

802.11g Wireless ADSL2+ VoIP IAD for Residential

- ADSL2+ high-speed Internet access
- Dedicate Fast Ethernet WAN
- 802.11g AP functions built-in
- SIP with 2 FXS port support
- Superior QoS and traffic management
- Remote provisioning and manage through TR-069/098/104

P-2612HW

802.11g Wireless ADSL2+ VoIP Combo WAN IAD

P-2612HW
ADSL2+/FE ETH VoIP IAD, 802.11g, 4 port F/E Switch,
SPI firewall, IPSec VPN, SIP, 2 FXS ports

Specifications

WAN connection	ADSL2+, 10/100 Mbps ETH
Bridge/Router functionality	RIP I/II, IP Policy Routing, IGMP v1/v2/v3*, DHCP Client/Server/Relay, NAT
VoIP	2 FXS port, G.711/G.726/G.729ab/G.722*
QoS/VLAN	IP QoS, IEEE 802.1p/1q, ATM QoS
Wireless	IEEE 802.11g compliant, Data Rate: 54 Mbps, Frequency Range: 2.4 GHz
Security & Firewall	SPI Firewall, Content Filtering, IPSec VPN
Management	Via Web/Telnet/FTP/SNMP/ICMP, TR-069/098/104
Green	EuP, CoC, WEEE & RoHS, Wi-Fi Scheduling
Others	UPnP
Dimensions	218 x 144 x 40 mm (WxDxH)

** Firmware upgradeable for future enhancement.*

802.11n ADSL2+ VoIP IAD for Residential

- ADSL2+ high-speed Internet access
- 802.11n AP functions built-in (1x1)
- SIP with 1 FXS port support
- Full FXO for L model only
- Superior QoS and traffic management
- Remote provisioning and manage through TR-069/098/104

P-2601HN

802.11n Wireless ADSL2+ VoIP IAD

P-2601HN
ADSL2+ VoIP IAD, 802.11n 1x1, 4 port F/E Switch,
SPI firewall, SIP, 1 FXS ports, Full FXO

Specifications

WAN connection	ADSL2+
Bridge/Router functionality	RIP I/II, IP Policy Routing, IGMP v1/v2/v3*, DHCP Client/Server/Relay, NAT
VoIP	1 FXS port, G.711/G.726/G.729ab/G.722, Full FXO
QoS/VLAN	IP QoS, IEEE 802.1p/1q, ATM QoS
Wireless	IEEE 802.11n compliant, Data Rate: 150 Mbps, Frequency Range: 2.4 GHz
Security & Firewall	SPI Firewall, Content Filtering
Management	Via Web/Telnet/FTP/SNMP/ICMP, TR-069/098/104
Green	EuP, CoC, WEEE & RoHS, Wi-Fi Scheduling
Others	UPnP
Dimensions	188 x 131 x 42 mm (WxDxH)

** Firmware upgradeable for future enhancement.*

802.11g Wireless ADSL2+ VoIP IAD for SOHO

- ADSL2+ high-speed Internet access
- 802.11g AP functions built-in
- SIP with 8 FXS port support
- Full FXO
- IP QoS support for triple-play services

P-2608HWL

802.11g Wireless ADSL2+ VoIP IAD

P-2608HWL
ADSL2+ VoIP IAD, 802.11g, 4 port F/E Switch, SPI firewall,
IPSec VPN, SIP, 8 FXS ports, Full FXO

Specifications

WAN connection	ADSL2+
Bridge/Router functionality	RIP I/II, IP Policy Routing, IGMP v1/v2, DHCP Client/Server/Relay, NAT
VoIP	8 FXS port, G.711/G.729ab, Full FXO
QoS/VLAN	IP QoS, 802.1p/1q, ATM QoS
Wireless	IEEE 802.11g compliant, Data Rate: 54 Mbps, Frequency Range: 2.4 GHz
Security & Firewall	SPI Firewall, Content Filtering, IPSec VPN
Management	Via Web/Telnet/FTP/SNMP/ICMP
Green	EuP, CoC, WEEE & RoHS
Others	UPnP
Dimensions	245 x 163 x 37 mm (WxDxH)

802.11g Wireless ADSL2+ VoIP IAD for Residential

- ADSL2+ high-speed Internet access
- 802.11g AP functions built-in
- SIP with 2 FXS port support
- Full FXO for L model only
- IP QoS support for triple-play services
- Remote manage through TR-069/104

P-2602HW

802.11g Wireless ADSL2+ VoIP IAD

P-2602HW
ADSL2+ VoIP IAD, 802.11g, 4 port F/E Switch, SPI firewall,
IPSec VPN, SIP, 2 FXS ports, Full FXO

Specifications

WAN connection	ADSL2+
Bridge/Router functionality	RIP I/II, IP Policy Routing, IGMP v1/v2, DHCP Client/Server/Relay, NAT
VoIP	2 FXS port, G.711/G.726/G.729ab/G.723, Full FXO
QoS/VLAN	IP QoS, IEEE 802.1p/1q, ATM QoS
Wireless	IEEE 802.11g compliant, Data Rate: 54 Mbps, Frequency Range: 2.4 GHz
Security & Firewall	SPI Firewall, Content Filtering, IPSec VPN
Management	Via Web/Telnet/FTP/SNMP/ICMP, TR-069/104
Green	EuP, CoC, WEEE & RoHS
Others	UPnP
Dimensions	165 x 65 x 242 mm (WxDxH)

ADSL2+ VoIP IAD for Residential

- ADSL2+ high-speed Internet access
- SIP with 2 FXS port support
- Full FXO for L model only
- IP QoS support for triple-play services

P-2602R

ADSL2+ VoIP IAD

P-2602R
ADSL2+ VoIP IAD, 1 port F/E Switch,
SPI firewall, SIP, 2 FXS ports, Full FXO

Specifications

WAN connection	ADSL2+
Bridge/Router functionality	RIP I/II, IP Policy Routing, IGMP v1/v2, DHCP Client/Server/Relay, NAT
VoIP	2 FXS port, G.711/G.729ab, Full FXO
QoS/VLAN	IP QoS, 802.1p/1q, ATM QoS
Wireless	IEEE 802.11g compliant, Data Rate: 54 Mbps, Frequency Range: 2.4 GHz
Security & Firewall	SPI Firewall, Content Filtering
Management	Via Web/Telnet/FTP/SNMP/ICMP
Green	EuP, CoC, WEEE & RoHS
Others	UPnP
Dimensions	43 x 124 x 181 mm (WxDxH)

P-793H v2

G.SHDSL.bis Bonded Broadband Gateway

G.SHDSL.bis Gateway for SOHO

- High-speed symmetric data transmission (G.SHDSL.bis support)
- ITU-T G.998.1 (G.Bond) support: 4-wire bundle for higher bandwidth and longer distance
- ATM/EFM support and auto-sense
- Robust firewall security (SPI and DoS) and IPSec VPN
- Remote management through TR-069

P-793H v2
Broadband router/bridge with G.SHDSL modem, 4 port switch, 2-/4-wire, 5.7/11.4 Mbit, SPI firewall, IPSec VPN

The P-793H v2 is a highly flexible G.SHDSL gateway supporting either ATM mode or EFM mode to provide small business or branch offices with high-speed point-to-point connection and Internet access through G.SHDSL over copper lines. The device supports the latest G.SHDSL.bis technology with higher symmetric upstream and downstream data rates of up to 11.4 Mbps. The rate-negotiating feature allows the P-793H v2 to adjust data rates automatically according to the quality of wire connection, while the Quality of Service feature ensures smooth connections for inbound and outbound data with minimal traffic congestion. The P-793H v2 also supports IPSec VPN for users to create secure data communication between two or more sites; its rich firewall security features such as SPI, DoS attack prevention and URL Content Filtering are also integrated to provide users with unparalleled access protection.

Specifications

WAN connection	G.SHDSL/G.SHDSL.bis Bonding (4-wire)
Bridge/Router functionality	Bridge/Router, NAT, DHCP Client/Server/Relay, RIP I/II, IGMP v1/v2
QoS/VLAN	ATM QoS, 802.1p/q, IP QoS
Security & Firewall	10 IPSec VPN Tunnels, SPI Firewall, Content Filtering
Management	Via Web/Telnet/FTP/SNMP/ICMP, TR-069
Green	EuP, WEEE & RoHS
Others	UPnP
Dimensions	178 x 125 x 31 mm (WxDxH)

P-792H v2

G.SHDSL.bis Broadband Gateway

G.SHDSL.bis Gateway for SOHO

- High-speed symmetric data transmission (G.SHDSL.bis support)
- ATM/EFM support and auto-sense
- Robust firewall security (SPI and DoS) and IPSec VPN
- Remote management through TR-069

P-792H v2
Broadband router/bridge with G.SHDSL modem, 4 port switch, SPI firewall, IPSec VPN

Specifications

WAN connection	G.SHDSL/G.SHDSL.bis
Bridge/Router functionality	Bridge/Router, NAT, DHCP Client/Server/Relay, RIP I/II, IGMP v1/v2
QoS/VLAN	ATM QoS, 802.1p/q, IP QoS
Security & Firewall	5 IPSec VPN Tunnels, SPI Firewall, Content Filtering
Management	Via Web/Telnet/FTP/SNMP/ICMP, TR-069
Green	EuP, WEEE & RoHS
Others	UPnP
Dimensions	178 x 125 x 31 mm (WxDxH)

P-791R v2

G.SHDSL.bis Broadband Gateway

G.SHDSL.bis Gateway for SOHO

- High-speed symmetric data transmission (G.SHDSL.bis support)
- Auto failover and fallback WAN backup solution

P-791R v2
Broadband router/bridge with G.SHDSL modem

Specifications

WAN connection	G.SHDSL/G.SHDSL.bis
Bridge/Router functionality	Bridge/ Router, NAT, DHCP Client/Server/Relay, RIP I/II, IGMP v1/v2
QoS/VLAN	ATM QoS
Management	Via Web/Telnet/FTP/SNMP
Green	EuP, WEEE & RoHS
Others	UPnP
Dimensions	180 x 127 x 36 mm (WxDxH)

Model Name	P-870HN	P-870H	P-870HW	P-871M	P-870M v2
Description	VDSL2/ADSL2+ Dual Mode Wireless 4-port Gateway	VDSL2 4-port Gateway	802.11g Wireless VDSL2 4-port Gateway	VDSL Point to Point Solution	VDSL2 Modem
WAN Interface	DSL RJ-11/RJ-45	DSL RJ-11/RJ-45	DSL RJ-11/RJ-45	DSL RJ-45	DSL RJ-11/RJ-45
Ethernet Port (10/100)	4	4	4	1	1
DSL Compliance					
Standards	VDSL2/ADSL2+ (Up to 17a profile)	VDSL2 (Up to 17a profile)	VDSL2 (Up to 17a profile)	VDSL (DS/US: 80M/40M)	VDSL2 (Up to 30a profile)
Wireless Feature					
WLAN	IEEE 802.11n compliance	-	IEEE 802.11b/g compliance	-	-
Firewall					
Stateful Packet Inspection	Yes	Yes	Yes	-	-
Denial of Service	Yes	Yes	Yes	-	-
QoS					
802.1p Priority Queue	4	4	4	-	-
802.1q Tag/ Port-based VLAN	Yes	Yes	Yes	-	-
Network					
TCP/IP	Yes	Yes	Yes	-	-
PPPoE	Yes	Yes	Yes	-	-
DHCP Client	Yes	Yes	Yes	-	-
PPPoA	Yes	-	-	-	-
DHCP Server	Yes	Yes	Yes	-	-
UPnP	Yes	Yes	Yes	-	-
IP Policy Routing	Yes	Yes	Yes	-	-
Multi-to-Multi NAT	Yes	Yes	Yes	-	-
Dynamic DNS (DDNS)	Yes	Yes	Yes	-	-
IGMP	Yes	Yes	Yes	-	-
Management					
Web Configurator	Yes	Yes	Yes	-	-
TR-069	Yes	Yes	Yes	-	-
Remote Firmware Upgrade	Yes	Yes	Yes	-	-
SNMP	Yes	Yes	Yes	-	-
Security					
PAP/CHAP	Yes	Yes	Yes	-	-
MS-CHAP	Yes	Yes	Yes	-	-
Protocol and Generic Packet Filter	Yes	Yes	Yes	-	-

Model Name	P-2812HNU/P-2812HNUL	P-2802HW/P-2802HWL
Description	802.11n Wireless VDSL2 VoIP IAD	802.11g Wireless VDSL2 VoIP IAD
WAN Interface	DSL RJ-11/RJ-45/GE	DSL RJ-11/RJ-45
Ethernet Port (10/100)	-	4
Ethernet Port (10/100/1000)	5 (1 for ETH WAN)	-
POTS FXS Port	2	2
PSTN Lifeline Port	0/1	0/1
USB Port	2	-
Voice Features		
SIP v2 (RFC 3261)	Yes	Yes
SDP (RFC 2327)	Yes	Yes
RTP (RFC 1889)	Yes	Yes
RTCP (RFC 1890)	Yes	Yes
G.168 Echo Cancellation	Yes	Yes
VAD/CNG	Yes	Yes
CODEC	G.711/G.726/G.729ab* (option)/G.722	G.711/G.729ab
DTMF Detection	Yes	Yes
DTMF: In-Band and Out-of-Band (RFC 2833), (SIP INFO)	Yes	Yes
QoS (IP Bandwidth Management)	Yes	Yes
ToS Support	Yes	Yes
Phonebook	Yes	Yes
FAX, Modem Detection and Pass-through	Yes	Yes
T.38 FAX	Yes	Yes
IVR	Yes	Yes
Early Media	Yes	Yes
Call Waiting	Yes	Yes
Call Hold	Yes	Yes
Call Transferring	Yes	Yes
Call Forwarding	Yes	Yes
Do Not Disturb	Yes	Yes
Three Way Conference	Yes	Yes
Flexible Dial Plan	Yes	Yes
Lifeline Support		
Relay Emergency Call to PSTN	-/Yes	-/Yes
Dial a PSTN Call by Pre-fix Number	-/Yes	-/Yes
PSTN Relay when Power Down	-/Yes	-/Yes
Receive Incoming PSTN Phone Call	-/Yes	-/Yes
DSL Compliance		
Standards/Profile	VDSL2/ADSL2+	VDSL2 30a profile
Wireless Feature		
WLAN	IEEE 802.11n	IEEE 802.11b/g
Firewall		
Stateful Packet Inspection	Yes	Yes
Denial of Service	Yes	Yes
VPN		
IPSec	Yes	Yes
Network		
TCP/IP	Yes	Yes
PPPoE	Yes	Yes
DHCP Client/Server/Relay	Yes	Yes
PPPoA	Yes	Yes
DHCP Server	Yes	Yes
UPnP	Yes	Yes
IP Policy Routing	Yes	Yes
Multi-to-Multi NAT	Yes	Yes
Dynamic DNS (DDNS)	Yes	Yes
IGMP	Yes	Yes
Management		
Web Configurator	Yes	Yes
TR-069/TR-104	Yes	Yes
Remote Firmware Upgrade	Yes	Yes
SNMP	Yes	Yes

Model Name	P-660R	P-660RU	P-660W	P-660H	P-660HW	P-660HN	P-661H
Description	ADSL2+ One Port Router	ADSL2+ One Port/ Combo Router	802.11g Wireless ADSL2+ One Port Router	ADSL2+ 4-port Gateway	802.11g Wireless ADSL2+ 4-port Gateway	802.11n Wireless ADSL2+ 4-port Gateway	ADSL2+ 4-port Security Gateway
WAN Interface	DSL RJ-11/RJ-45	DSL RJ-11/RJ-45	DSL RJ-11/RJ-45	DSL RJ-11/RJ-45	DSL RJ-11/RJ-45	DSL RJ-11/RJ-45	DSL RJ-11/RJ-45
Ethernet Port (10/100)	1	1	1	4	4	4	4
USB Port	-	Slave x 1	-	-	-	-	-
DSL Compliance							
Standards	ADSL2+	ADSL2+	ADSL2+	ADSL2+	ADSL2+	ADSL2+	ADSL2+
Wireless Feature							
WLAN	-	-	IEEE 802.11g	-	IEEE 802.11g	IEEE 802.11n	-
WPS Button	-	-	-	-	-	Yes	-
Firewall							
Stateful Packet Inspection	-	-	-	Yes	Yes	Yes	Yes
Denial of Service	-	-	-	Yes	Yes	Yes	Yes
VPN							
IPSec VPN Tunnels	-	-	-	-	-	-	2
QoS							
IP QoS/VLAN	-	-	-	-	-	Yes	-
MBM QoS	-	-	-	Yes	Yes	-	Yes
ATM QoS	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Network							
TCP/IP	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PPPoE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DHCP Client	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PPPoA	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DHCP Server	Yes	Yes	Yes	Yes	Yes	Yes	Yes
UPnP	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IP Policy Routing	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Multi-to-Multi NAT	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dynamic DNS (DDNS)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IGMP	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Management							
Web Configurator	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TR-069	Yes	Yes	Yes	Yes	Yes	Yes	-
Remote Firmware Upgrade	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SNMP	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Security							
PAP/CHAP	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MS-CHAPv1 and v2	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Protocol and Generic Packet Filter	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Model Name	P-661HW	P-661HNU	P-662H	P-662HW	P-663H	P-663HN
Description	802.11g Wireless ADSL2+ 4-port Security Gateway	802.11n Wireless ADSL2+ 4-port Security Gateway	ADSL2+ 4-port Security Gateway	802.11g Wireless ADSL2+ 4-port Security Gateway	ADSL2+ 4-port Router with Port Bonding	802.11n Wireless ADSL2+ 4-port Router with Port Bonding
WAN Interface	DSL RJ-11/RJ-45	DSL RJ-11/RJ-45	DSL RJ-11/RJ-45	DSL RJ-11/RJ-45	DSL RJ-11/RJ-45	DSL RJ-11/RJ-45
Ethernet Port (10/100)	4	4	4	4	4	4
USB Port	-	Host x 2	-	-	-	
DSL Compliance						
Standards	ADSL2+	ADSL2+	ADSL2+	ADSL2+	ADSL2+ bonding	ADSL 2+ bonding
Wireless Feature						
WLAN	IEEE 802.11g	IEEE 802.11n	-	IEEE 802.11g	-	IEEE 802.11n
WPS Button	-	Yes	-	-	-	Yes
Firewall						
Stateful Packet Inspection	Yes	Yes	Yes	Yes	Yes	Yes
Denial of Service	Yes	Yes	Yes	Yes	Yes	Yes
VPN						
IPSec VPN Tunnels	2	2	20	20	-	-
QoS						
IP QoS/VLAN	-	Yes	-	-	Yes	-
MBM QoS	Yes	-	Yes	Yes	-	-
ATM QoS	Yes	Yes	Yes	Yes	Yes	Yes
Network						
TCP/IP	Yes	Yes	Yes	Yes	Yes	Yes
PPPoE	Yes	Yes	Yes	Yes	Yes	Yes
DHCP Client	Yes	Yes	Yes	Yes	Yes	Yes
PPPoA	Yes	Yes	Yes	Yes	Yes	Yes
DHCP Server	Yes	Yes	Yes	Yes	Yes	Yes
UPnP	Yes	Yes	Yes	Yes	Yes	Yes
IP Policy Routing	Yes	Yes	Yes	Yes	Yes	Yes
Multi-to-Multi NAT	Yes	Yes	Yes	Yes	Yes	Yes
Dynamic DNS (DDNS)	Yes	Yes	Yes	Yes	Yes	Yes
IGMP	Yes	Yes	Yes	Yes	Yes	Yes
Management						
Web Configurator	Yes	Yes	Yes	Yes	Yes	Yes
TR-069	-	Yes	-	-	Yes	Yes
Remote Firmware Upgrade	Yes	Yes	Yes	Yes	Yes	Yes
SNMP	Yes	Yes	Yes	Yes	Yes	Yes
Security						
PAP/CHAP	Yes	Yes	Yes	Yes	Yes	Yes
MS-CHAPv1 and v2	Yes	Yes	Yes	Yes	Yes	Yes
Protocol and Generic Packet Filter	Yes	Yes	Yes	Yes	Yes	Yes

Model Name	P-2612HNU	P-2612HW	P-2601HN/P-2601HNL
Description	802.11n Wireless ADSL2+ VoIP IAD	802.11g Wireless ADSL2+ VoIP IAD	802.11n Wireless ADSL2+ VoIP IAD
WAN Interface	DSL RJ-11/RJ-45/GE	DSL RJ-11/RJ-45/FE	DSL RJ-11/RJ-45
Ethernet Port (10/100)	-	5 (1 for ETH WAN)	4
Ethernet Port (10/100/1000)	5 (1 for ETH WAN)	-	-
POTS FXS Port	2	2	1
PSTN Lifeline Port	0	0	0/1
USB Port	2	-	-
Voice Features			
SIP v2 (RFC 3261)	Yes	Yes	Yes
SDP (RFC 2327)	Yes	Yes	Yes
RTP (RFC 1889)	Yes	Yes	Yes
RTCP (RFC 1890)	Yes	Yes	Yes
G.168 Echo Cancellation	Yes	Yes	Yes
VAD/CNG	Yes	Yes	Yes
CODEC	G.711/G.726/G.729ab/G.722	G.711/G.729ab/G.722*	G.711/G.726/G.729ab/G.722
DTMF detection	Yes	Yes	Yes
DTMF: In-Band and Out-of-Band (RFC 2833), (SIP INFO)	Yes	Yes	Yes
QoS (IP Bandwidth Management)	Yes	Yes	Yes
ToS Support	Yes	Yes	Yes
Phonebook	Yes	Yes	Yes
FAX, Modem Detection and Pass-through	Yes	Yes	Yes
T.38 FAX	Yes	Yes	Yes
IVR	Yes	Yes	Yes
Early Media	Yes	Yes	Yes
Call Waiting	Yes	Yes	Yes
Call Hold	Yes	Yes	Yes
Call Transferring	Yes	Yes	Yes
Call Forwarding	Yes	Yes	Yes
Do Not Disturb	Yes	Yes	Yes
Three Way Conference	Yes	Yes	Yes
Flexible Dial Plan	Yes	Yes	Yes
Lifeline Support			
Relay Emergency Call to PSTN	-	-	-/Yes
Dial a PSTN Call by Pre-fix Number	-	-	-/Yes
PSTN Relay when Power Down	-	-	-/Yes
Receive Incoming PSTN Phone Call	-	-	-/Yes
DSL Compliance			
Standards	ADSL2/2+, T1.413 Issue2, G.dmt, G.lite, G.hs	ADSL2/2+, T1.413 Issue2, G.dmt, G.lite, G.hs	ADSL2/2+, T1.413 Issue2, G.dmt, G.lite, G.hs
Wireless Feature			
WLAN	IEEE 802.11n	IEEE 802.11b/g	IEEE 802.11n (1x1)
Firewall			
Stateful Packet Inspection	Yes	Yes	Yes
Denial of Service	Yes	Yes	Yes
VPN			
IPSec	Yes	Yes	-
Network			
TCP/IP	Yes	Yes	Yes
PPPoE	Yes	Yes	Yes
DHCP Client/Server/Relay	Yes	Yes	Yes
PPPoA	Yes	Yes	Yes
DHCP Server	Yes	Yes	Yes
UPnP	Yes	Yes	Yes
IP Policy Routing	Yes	Yes	Yes
Multi-to-Multi NAT	Yes	Yes	Yes
Dynamic DNS (DDNS)	Yes	Yes	Yes
IGMP	Yes	Yes	Yes
Management			
Web Configurator	Yes	Yes	Yes
TR-069/TR-104	Yes	Yes	Yes
Remote Firmware Upgrade	Yes	Yes	Yes
SNMP	Yes	Yes	Yes

DSL CPE
Feature Matrix

Model Name	P-2602HW/P-2602HWL	P-2608HWL	P-2602R/P-2602RL
Description	802.11g Wireless ADSL2+ VoIP IAD	802.11g Wireless ADSL2+ VoIP IAD with Lifeline	ADSL2+ VoIP IAD
WAN Interface	DSL RJ-11/RJ-45	DSL RJ-11/RJ-45	DSL RJ-11/RJ-45
Ethernet Port (10/100)	4	4	1
Ethernet Port (10/100/1000)	-	-	-
POTS FXS Port	2	8	2
PSTN Lifeline Port	0/1	1	0/1
USB Port	-	-	-
Voice Features			
SIP v2 (RFC 3261)	Yes	Yes	Yes
SDP (RFC 2327)	Yes	Yes	Yes
RTP (RFC 1889)	Yes	Yes	Yes
RTCP (RFC 1890)	Yes	Yes	Yes
G.168 Echo Cancellation	Yes	Yes	Yes
VAD/CNG	Yes	Yes	Yes
CODEC	G.711/G.726/G.729ab/G.723	G.711/G.729ab	G.711/G.729ab
DTMF detection	Yes	Yes	Yes
DTMF: In-Band and Out-of-Band (RFC 2833), (SIP INFO)	Yes	Yes	Yes
QoS (IP Bandwidth Management)	Yes	Yes	Yes
ToS Support	Yes	Yes	Yes
Phonebook	Yes	Yes	Yes
FAX, Modem Detection and Pass-through	Yes	Yes	Yes
T.38 FAX	Yes	Yes	Yes
IVR	Yes	Yes	Yes
Early Media	Yes	Yes	Yes
Call Waiting	Yes	Yes	Yes
Call Hold	Yes	Yes	Yes
Call Transferring	Yes	Yes	Yes
Call Forwarding	Yes	Yes	Yes
Do Not Disturb	Yes	Yes	Yes
Three Way Conference	Yes	Yes	Yes
Flexible Dial Plan	Yes	Yes	Yes
Lifeline Support			
Relay Emergency Call to PSTN	-/Yes	Yes	-/Yes
Dial a PSTN Call by Pre-fix Number	-/Yes	Yes	-/Yes
PSTN Relay when Power Down	-/Yes	Yes	-/Yes
Receive Incoming PSTN Phone Call	-/Yes	Yes	-/Yes
DSL Compliance			
Standards	ADSL2/2+, T1.413 Issue2, G.dmt, G.lite, G.hs	ADSL2/2+, T1.413 Issue2, G.dmt, G.lite, G.hs	ADSL2/2+, T1.413 Issue2, G.dmt, G.lite, G.hs
Wireless Feature			
WLAN	IEEE 802.11b/g	IEEE 802.11b/g	-
Firewall			
Stateful Packet Inspection	Yes	Yes	Yes
Denial of Service	Yes	Yes	Yes
VPN			
IPSec	Yes	Yes	-
Network			
TCP/IP	Yes	Yes	Yes
PPPoE	Yes	Yes	Yes
DHCP Client/Server/Relay	Yes	Yes	Yes
PPPoA	Yes	Yes	Yes
DHCP Server	Yes	Yes	Yes
UPnP	Yes	Yes	Yes
IP Policy Routing	Yes	Yes	Yes
Multi-to-Multi NAT	Yes	Yes	Yes
Dynamic DNS (DDNS)	Yes	Yes	Yes
IGMP	Yes	Yes	Yes
Management			
Web Configurator	Yes	Yes	Yes
TR-069/TR-104	Yes	-	-
Remote Firmware Upgrade	Yes	Yes	Yes
SNMP	Yes	Yes	Yes

DSL CPE
Feature Matrix

Model Name	P-793H v2	P-792H v2	P-791R v2
Description	4-wire bonded G.SHDSL.bis 4-port Gateway	G.SHDSL.bis 4-port Gateway	G.SHDSL.bis Gateway
WAN Interface	DSL RJ-11	DSL RJ-11	DSL RJ-11
Ethernet Port (10/100)	4	4	1
Ethernet Port (1000)	-	-	-
DSL Compliance			
Standards	G.SHDSL.bis	G.SHDSL.bis	G.SHDSL.bis
Wireless Feature			
WLAN	-	-	-
Firewall			
Stateful Packet Inspection	Yes	Yes	-
Denial of Service	Yes	Yes	-
QoS			
802.1p Priority Queue	4	4	-
802.1q Tag/Port-based VLAN	Yes	Yes	-
Network			
TCP/IP	Yes	Yes	Yes
PPPoE	Yes	Yes	Yes
DHCP Client	Yes	Yes	Yes
PPPoA	Yes	Yes	Yes
DHCP Server	Yes	Yes	Yes
UPnP	Yes	Yes	Yes
IP Policy Routing	Yes	Yes	Yes
Multi-to-Multi NAT	Yes	Yes	Yes
Dynamic DNS (DDNS)	Yes	Yes	Yes
IGMP	Yes	Yes	Yes
Management			
Web Configurator	Yes	Yes	Yes
TR-069	Yes	Yes	-
Remote Firmware Upgrade	Yes	Yes	Yes
SNMP	Yes	Yes	Yes
Security			
PAP/CHAP	Yes	Yes	Yes
MS-CHAP	Yes	Yes	Yes
Protocol and Generic Packet Filter	Yes	Yes	Yes

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Corporate Headquarters

ZyXEL Communications Corp.
Tel: +886-3-578-3942
Fax: +886-3-578-2439
Email: sales@zyxel.com.tw
http://www.zyxel.com

Asia

ZyXEL China (Shanghai)
China Headquarters
Tel: +86-021-61199055
Fax: +86-021-52069033
Email: sales@zyxel.cn
http://www.zyxel.cn

ZyXEL China (Beijing)
Tel: +86-010-82800646
Fax: +86-010-82800587
Email: sales@zyxel.cn
http://www.zyxel.cn

ZyXEL China (Guangzhou)
Tel: +86-020-87584480
Fax: +86-020-87576311
Email: sales@zyxel.cn
http://www.zyxel.cn

ZyXEL China (Tianjin)
Tel: +86-022-87893801
Fax: +86-022-87892304
Email: sales@zyxel.cn
http://www.zyxel.cn

ZyXEL China (Wuxi)
Tel: +86-510-88080888
Fax: +86-510-85222670
Email: info@zyxel.cn
http://www.zyxel.cn

ZyXEL India
Tel: +91-11-4760-8800
Fax: +91-11-4052-3393
Email: info@zyxel.in
http://www.zyxel.in

ZyXEL Kazakhstan
Tel: +7-727-2-590-699
Fax: +7-727-2-590-689
Email: info@zyxel.kz
http://www.zyxel.kz

ZyXEL Malaysia
Tel: +603-7960-0088
Fax: +603-7960-8802
Email: info@zyxel.com.my
http://www.zyxel.com.my

ZyXEL Pakistan Pvt. Ltd.
Tel: +92 213 4310194-5
Fax: +92 213 4310196
Email: info@zyxel.com.pk
http://www.zyxel.com.pk

ZyXEL Singapore
Tel: +65-6899-6678
Fax: +65-6899-8887
Email: sales@zyxel.com.sg
http://www.zyxel.com.sg

ZyXEL Taiwan (Taipei)
Tel: +886-2-2739-9889
Fax: +886-2-2735-3220
Email: sales_tw@zyxel.com.tw
http://www.zyxel.com.tw

ZyXEL Thailand
Tel: +66-(0)-2831-5315
Fax: +66-(0)-2831-5395
Email: info@zyxel.co.th
http://www.zyxel.co.th

Europe

ZyXEL Belarus
Tel: +375 17 334 6099
Fax: +375 17 334 5899
Email: sales@zyxel.by
http://www.zyxel.by

ZyXEL BeNeLux
Tel: +31 23 5553689
Fax: +31 23 5578492
Email: sales@zyxel.nl
http://www.zyxel.nl
http://www.zyxel.be

ZyXEL Czech
Tel: +420 241 091 350
Fax: +420 241 091 359
Email: info@cz.zyxel.com
http://www.zyxel.cz

ZyXEL Denmark A/S
Tel: +45 39 55 07 00
Fax: +45 39 55 07 07
Email: sales@zyxel.dk
http://www.zyxel.dk

ZyXEL Finland
Tel: +358-9-4780 8400
Fax: +358-9-4780 8448
Email: myynti@zyxel.fi
http://www.zyxel.fi

ZyXEL France
Tel: +33 (0)4 72 52 97 97
Fax: +33 (0)4 72 52 19 20
Email: info@zyxel.fr
http://www.zyxel.fr

ZyXEL Germany GmbH
Tel: +49 (0) 2405-6909 0
Fax: +49 (0) 2405-6909 99
Email: sales@zyxel.de
http://www.zyxel.de

ZyXEL Hungary
Tel: +36-1-336-1646
Fax: +36-1-325-9100
Email: info@zyxel.hu
http://www.zyxel.hu

ZyXEL Italy
Tel: 800 99 26 04
Fax: +39 011 274 7647
Email: sales@zyxel.it
http://www.zyxel.it

ZyXEL Norway A/S
Tel: +47 22 80 61 80
Fax: +47 22 80 61 81
Email: sales@zyxel.no
http://www.zyxel.no

ZyXEL Poland
Tel: +48 (22) 333 8250
Fax: +48 (22) 333 8251
Email: info@pl.zyxel.com
http://www.zyxel.pl

ZyXEL Russia
Tel: +7 (495) 542-8920
Fax: +7 (495) 542-8925
Email: info@zyxel.ru
http://www.zyxel.ru

ZyXEL Slovakia
Tel: +421 243 193 989
Fax: +421 243 193 990
Email: info@sk.zyxel.com
http://www.zyxel.sk

ZyXEL Spain
Tel: +34 902 195 420
Fax: +34 913 005 345
Email: sales@zyxel.es
http://www.zyxel.es

ZyXEL Sweden A/S (Göteborg)
Tel: +46 (0) 31 744 77 00
Fax: +46 (0) 31 744 77 01
Email: sales@zyxel.se
http://www.zyxel.se

ZyXEL Sweden A/S (Stockholm)
Tel: +46 8 752 9600
Fax: +46 8 752 9610
Email: sales@zyxel.se
http://www.zyxel.se

ZyXEL Switzerland
Tel: +41 (0)44 806 51 00
Fax: +41 (0)44 806 52 00
Email: info@zyxel.ch
http://www.zyxel.ch

ZyXEL Turkey A.S.
Tel: +90 212 314 18 00
Fax: +90 212 220 25 26
Email: bilgi@zyxel.com.tr
http://www.zyxel.com.tr

ZyXEL UK Ltd.
Tel: +44 (0) 118 9121 700
Fax: +44 (0) 118 9797 277
Email: sales@zyxel.co.uk
http://www.zyxel.co.uk

ZyXEL Ukraine
Tel: +380 44 494 49 31
Fax: +380 44 494 49 32
Email: sales@ua.zyxel.com
http://www.ua.zyxel.com

The Americas

ZyXEL Costa Rica
Tel: +506-22017878
Fax: +506-22015098
Email: sales@zyxel.co.cr
http://www.zyxel.co.cr

ZyXEL USA
North America Headquarters
Tel: +1-714-632-0882
Fax: +1-714-632-0858
Email: sales@zyxel.com
http://www.us.zyxel.com

For more product information, visit us on the web at www.ZyXEL.com

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